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ABSTRACT

This second volume of a two-volume report is based on the experiences of teachers who participated in a project at the New Jersey Institute of Technology (NJIT) which assessed the effectiveness of a Virtual Classroom (VC), in which students and teachers communicate through a computer-mediated system called the Electronic Information Exchange System (EIES). An overview of techniques that can be used to improve the quality of online courses is provided. Drawn from observation and teaching of online classes, student comments, and instructors' case reports, techniques are suggested for several areas: assuring access; course design and preparation; introductory remarks and activities; clarifying expectations; leading discussions; organizing material; and stimulating active participation. Uses of computer-mediated communication to supplement other modes of delivery are described. The appendix provides examples of instructor comments and student interactions, as well as narrative course reports by eight VC instructors. Eight references are listed, and a 21-item annotated bibliography of materials on computer-mediated communication and education is included. (MES)

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Teaching in a Virtual Classroom

Volume 2 of A Virtual Classroom on EIES: Final Evaluation Report

Starr Roxanne Hiltz

Funded by
Annenberg/CPB Project

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TEACHING IN A VIRTUAL CLASSROOM

Starr Roxanne Hiltz

Volume 2 of
A Virtual Classroom on EIES: Final Evaluation Report

Research Report 26
Computerized Conferencing and Communications Center
New Jersey Institute of Technology
Newark NJ 07102

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TABLE OF CONTENTS

INTRODUCTION 1

GETTING STARTED 6
Assuring access 6
Course Design and Preparation 9
Initial Comments and Activities 12
Making Expectations Clear 14

THE INSTRUCTOR AS DISCUSSION LEADER AND ORGANIZER 17
The Instructor as Discussion Leader 18
Organizing Material and Keeping Track 20

TECHNIQUES FOR STIMULATING ACTIVE PARTICIPATION 23
Stimulating Active Participation 25

MIXED MEDIA COURSES 28

CONCLUSION 31

REFERENCES 33

APPENDIX I: EXEMPLARY INSTRUCTOR COMMENTS AND STUDENT INTERACTIONS 34
Exhibit A: The Welcome and Introduction 34
Exhibit B: Some Initial Segments of Introduction to Computer Science 37
Exhibit C: The Course Leader Makes Expectations Clear 40
Exhibit D: Letting Well Enough Alone 41
Exhibit E: Excerpts From Student-led Presentation and Discussion 42
Exhibit F: Excerpts From Student Discussion of MIS Requirements for "The Imperial Corporation" Simulation 47

APPENDIX II: NARRATIVE COURSE REPORTS 49

Suggested Outline for Course Narratives 49
Introduction to Computer Science (B.J. Gleason) 50
Introductory Sociology with EIES (Robert Meinke) 55
Computer-Assisted Statistics (Lincoln Brown)
First Semester 80
Second Semester 86
A Virtual Lab for Management Practice (L. Enrico Hsu) 90
The Second Time Around- 96
Anthropology with EIES (Kendy MacColl Rudy) 105
Organizational Communication (Starr Roxanne Hiltz) 114
Writing Seminar on Friendship (Mary Swigonski) 121
Statistics for Technology (Rose Ann Dios) 127

APPENDIX III: ANNOTATED BIBLIOGRAPHY
PUBLICATIONS ON CMC AND EDUCATION 138

INTRODUCTION

A Virtual Classroom is a teaching and learning environment located within a computer-mediated communication system. As a teaching environment, it provides a set of tools, strengths, and limitations which are available to an instructor for delivering course materials and structuring learning experiences. Its characteristics are merely potentials, just as the empty classroom with its chalkboards and desks await the efforts and creativity of the instructor and the students to make them "come alive."

This is the second volume of the final research report on experiences with the prototype of a Virtual Classroom system constructed and operated on EIES, the Electronic Information Exchange System at NJIT. The amount of data collected during this field experiment and the number of issues examined as part of the evaluation proved to be too much to be bound in one volume. The materials included in the first volume describe the project as a whole, and focus on the results related to the experiences of and impacts on the students. This volume looks at the Virtual Classroom from the teacher's point of view. Its purpose is to present the lessons learned by the faculty members who participated in the project, particularly in terms of guidelines or generalizations that may be of use to future instructors who are considering using computer-mediated communication as a mode of educational delivery.

There is no one way to be a successful teacher via computer-mediated communication (CMC), just as there is no single recipe for success in the traditional classroom. Whatever strategy is initially chosen will have to be modified on the basis of observations about

the level of motivation and ability of the students; this is true in any medium. However, there are some fundamental differences in terms of basic guidelines, stemming from the differences between the communication channels. There are three basic principles to keep in mind, dealing with media richness, timely responsiveness, and interaction:

(1) Media richness: In the traditional classroom, a pleasing voice, occasional jokes, dramatic gestures, and interspersed questions can help to enliven a long lecture. In CMC, there is only the screen and/or the printed pages. Long segments of lecture-type materials are boring. To maintain interest, you should use written language in a skillful way (including the use of humor and metaphor); orchestrate active participation by the students; and stimulate collaborative assignments that involve both social and task-oriented activities.

(2) Timely responsiveness: Unlike the face-to-face medium, students will not receive an immediate response to their questions and comments. This can be very frustrating, especially if they are "stuck" in the middle of a mathematics problem or other assignment. However, whereas they may have only a limited opportunity to ask questions during a few set hours a week for a traditional class, they can participate and receive feedback on a daily basis in the virtual classroom. But this depends on you. You need to sign on every day except for occasional announced exceptions to this policy, and respond to all waiting material. Most faculty report that this takes them about 30 minutes to an hour a day, depending on the number of students and the level of their activity.

(3) Interaction: Probably the greatest determinant of the extent to

which students feel that the online mode of delivery is better or worse than traditional modes is the amount and quality of interaction between you and the students, and/or among the students. This is not easy, as can be deduced from reading the course reports included as an appendix to this volume. But, as B.J. Gleason notes, if you can cajole or coerce the students into this collaborative approach to learning, they will share ideas with each other in a way that is seldom or never seen in a traditional classroom. Herein lies both the key and the challenge for being an effective teacher in the Virtual Classroom environment.

This report is a brief overview of some techniques that can be used to improve the probability of providing a valuable learning experience for students in online courses. It is based on qualitative data: observing and teaching online classes, looking at the comments and suggestions made by students, and case reports by instructors. The first two appendices present excerpts from actual courses, and narrative case histories of instructors' experiences in using the Virtual Classroom on EIES, in order to give the reader a feeling for the diversity of teaching techniques and experiences which underlie this summary. You may wish to look through these materials before reading the body of the report. The third appendix included in this volume is an annotated bibliography of other publications relating to teaching and learning via Computer-Mediated Communication (CMC). For those considering teaching courses similar to the ones included in this project, diskettes of the actual materials used are available for adaptation.

The appendices and reports on this project refer to some features of the particular software used, such as Branch Activities

on EIES (Hiltz, 1986). In utilizing other CMC systems which do not incorporate these features, it may be possible to devise analogous procedures. For example, additional conferences might be set up for specific types of exchanges or activities related to a course, rather than organizing and segregating them as a "branch."

In many ways, teaching a course online is merely a variation of moderating any computer conference. (See Kerr, 1984, for more details on how to moderate online conferences, particularly for details relating to mechanics of using the EIES system.) As in any computerized conference, the outcomes are dependent upon both the skills and hard work of the moderator, and the skills and level of motivation of the members of the conference.

CMC can be used to deliver an entire course online, or as an adjunct to other media. The last section of this report will describe some of the ways in which it can be used to support face-to-face classrooms or distance education delivered via media such as television or print materials.

Choosing an Appropriate Course

We have noted that interaction among the members of a class is an essential characteristic of successful application of the Virtual Classroom approach to education. There are several preconditions for success related to this aspect of the medium.

In order for interaction to occur, students must be motivated to learn and able to communicate by typing and reading. In some educational settings, this may not be a problem. In others, it may be a severe obstacle. It is pretty hopeless to try to use CMC to develop higher-level cognitive skills if the students are having trouble with reading and writing. Likewise, if a course is a "required" one which many students resent taking and about which they

profess feelings ranging from lack of interest to fear and hostility, the Virtual Classroom is not recommended. It requires more effort from students than the traditional classroom, where all they have to do is show up and take notes.

CMC is not as effective as books or lectures for the one-way delivery of information, for most students. If the objective of a course is to follow a lock-step syllabus that requires students to memorize or master a great deal of information or specific skills, and that does not aim at having them discuss the material in any depth or to apply it in a creative way, then the course may be inappropriate for this medium.

GETTING STARTED

In order for students to participate effectively in the Virtual Classroom, they must have adequate access to the system, feel comfortable with the medium and with each other, and know what is expected of them. In order for the latter two preconditions to be realized, the instructor must be competent using the system and have a course design worked out ahead of time which is appropriate to the medium and the capabilities of the specific system.

Assuring Access

Instructors should have access to a microcomputer and modem from their homes as well as from their offices. In preparing for and offering an online course, especially for the first time, they will be spending several hundred hours online. In order for daily exchanges with students to be an enjoyable experience rather than an onerous burden, it is essential that faculty members be able to have the convenience and comfort of working nights and weekends from home.

If many hours are going to be spent online, instructors (and ideally students, too) should consider installing a second telephone line for the computer. Family members do not appreciate being cut off from the outside world for hours at a time! In addition, it is very likely that an instructor will want to be able to talk on the telephone to a student at the same time that they are signed online to watch what a student is doing there. Fortunately, second or "teen" lines are generally priced very reasonably. If you are not within a local phone call of the system or network node you are dialing, also look into extended calling arrangements with your local telephone company. These generally allow up to say 20 hours a month

of connection to a specific set of telephone numbers for a flat fee, such as $5.00.

Ideally, each student would also have access to online course material through a micro and modem at home, as well as equipment at school or work. In the ideal set-up, the micros and communication software would all be the same, so that a single set of instructions for connecting to and using the CMC system would suffice.

If you are going to rely on access through microcomputers at the university, make sure that there are adequate numbers of machines with modems and telephone lines available, that there are evening as well as daytime hours when students can use the equipment, and that any assistants who are available to help students use the equipment know how to establish a connection to the CMC. You cannot expect each individual student to master several kinds of hardware and communications software.

What is an adequate number of work stations? The problem is that student use does not distribute itself evenly through the week; many members of a class will wait until a few hours before an assignment or activity is "due" to sign online. A safe guideline would be to have at least half as many terminals or micros available as there are students in the largest online class. With any fewer, there is likely to be occasional frustrating queuing. There must also be adequate capability to send material to a printer; students should be able to easily obtain a print of anything which they may want to re-read in the future, after having seen it once on the screen. Check out all components of equipment access carefully before deciding to use CMC. For instance, it could take months to have new phone lines installed, if you discover that there is a microlab but no capacity for the machines to dial out to a remote

host.

To help remote students with their own microcomputers, develop a set of printed materials which show how to use the most widespread combinations of hardware and software which they have. Don't forget to include instructions for reaching the system through packet-switched networks or local area networks as well as direct dial. Recommend a single or perhaps two communications software packages for them to acquire if they are buying one, and give instructions for how to correctly set the communications parameters for these packages. For instance, we have found that SMARTCOM is a superior package, but it is relatively expensive; we also recommend the "shareware" program "Procomm" for those who do not want to spend money on software. Adequate and affordable communications software is a problem, so we included communications management in the Personal TEIES microcomputer software which we are developing. Diskettes of Personal TEIES can be sent to each student with the correct defaults and calling numbers already set. This could also be done with diskettes of other communications software distributed to students.

Have a telephone number students may call if they have trouble getting connected. Do not consider a person actually "registered" for a course until they have signed on and sent a communication. Call students who have failed to appear online for more than a few days past the scheduled starting date, and find out what the problem is.

Decide how you are going to introduce the students to the system and ease them online. An initial face-to-face meeting where students meet you and the others and learn the basics of using the system is a good idea if geographical dispersion makes this practical. If you

decide to try "hands on" training in system use rather than just a demonstration, there should be no more than two students per terminal, and one assistant to help every 4-6 learners. Ideally such a training session would be three or more hours long; certainly, 50 minutes is too short to accomplish anything except confusion. If your class is small, another idea is to schedule a first "synchronous" session where the entire class is online at the same time for about an hour and a half, so that you are available for immediate response to questions. If you do this, have a second phone line available so that students who have difficulty connecting can call for advice and successfully join the session. If there are more than about 15 students, consider breaking up the class into smaller sub-groups for the first face-to-face session or the synchronous session.

Course Design and Preparation

First, you as instructor must feel comfortable with the software and your hardware. Before trying to teach a course online, it is a good idea to participate in other conferences, practice using the editor, and observe some other online classes. Note, for instance, Robert Meinke's course report in the Appendix. Casual use of a system is not sufficient preparation for delivering an entire course online. If you have not thoroughly mastered the software and equipment you will be using, you may find, as he did, that the first month or so is "absorbed in coping with the mechanics of computing," and is exhausting and frustrating.

Plan out the entire course ahead of time, and prepare and store your "fixed" material such as lectures and assignments. Decide how you are going to organize the course, in terms of the use of structures such as multiple conferences for different activities,

branch activities, notebooks, etc. Make sure that you or a technical assistant has correctly added all students to the groups, conferences, and other work spaces they will need to have access to when they sign on. Then you should be able to concentrate on the dynamics of the course and on being responsive to the students, rather than staying up half the night preparing materials for the next day.

How long will it take to prepare a complete course for presentation online the first time? One guideline is that it will take about as long as it takes you to prepare a new course for presentation in a traditional classroom the first time; perhaps 100 to 300 hours. Even though you have offered a course "face-to-face," reorganizing and rethinking and preparing it for the new medium is almost like starting over again with a topic area for a course. In many institutions, reduced loads or special considerations are given for "new course preparations;" such considerations or allowances will also need to be made for faculty teaching courses via CMC.

In planning how a course can best be delivered online, you will find that you are forced to clearly identify its basic objectives, and to think a great deal about the types of instructional strategies and assignments that can be used to attain these learning objectives for the students. Designing a course for the Virtual Classroom can "introduce novelty and excitement" for the instructor as well as the students. The result, as Robert Meinke points out in his course report, is that you are likely to end up altering the way you teach courses in the traditional classroom in the future.

The second time you offer a course online, the amount of time and effort required on your part will be much less. The total time required will probably be comparable to that required for

preparation, delivery, grading, and counseling students in courses in the traditional classroom environment. However, the time will be distributed differently, spread throughout the week rather than being concentrated on one or two days.

Even though you start the course with a complete plan, be prepared to modify it depending on the ability of the students to maintain the pace and level of effort you had anticipated in your plan. This is really no different than teaching a face-to-face course, when you should have the whole course planned ahead, but be ready to modify the plans based on feedback from the students.

Decide which set of special instructional support tools you will use, e.g., response branches, quiz, and "handin" on EIES. Though each kind of special software tool may be useful, too many of them will become confusing to students, so you may need to go back and decide that some of the special commands or subsystems that might be helpful are really not necessary. Whenever students are requested to use a new command or software routine for the first time, explain it step-by-step. Make their first use of a new facility fairly easy substantively, and make sure that each student has mastered it. Many instructors give a first assignment which consists of sending a private message, reading waiting conference material, entering a comment or response in the conference, and handing in a fairly simple assignment. (For an example, see Exhibit B in the Appendix from CIS 213, the Introduction to Computer Science course offered as part of the virtual classroom project at NJIT during 1986-87).

Consider setting aside a special place for technical problems, such as a branch in the class conference or a separate conference. Encourage students to help their peers with their questions in this side discussion, rather than taking on the burden of answering all of

the questions about system use yourself. This will help to build group cohesiveness and improve the self confidence of the "helpers," as well as taking a considerable burden off you.

Initial Comments and Activities

Have an individually addressed message waiting for each class member when they sign on. This might welcome them, ask them to send a message back to you describing any impressions or difficulties so far, and direct them on how to go to the class conference after sending their return message. The purpose of this message and requested response is to help you keep track of which students have "made it" and which may be having difficulties. If the system you are using does not automatically store a record of when messages are received, keep your own list of the progress of your beginners in finding their electronic way to the class.

Students must form a "group," a "we," if an online course is to proceed well. One way to facilitate this is to ask students to enter medium-length introductions in which they mention not just resume-type facts like their major or their job, but also personal things like their hobbies and their marital status. This might be entered either as a regular conference comment or as a branch response during the first week, as part of their first assignments.

Spend some time planning and writing the welcoming and orienting comments that will await the students when they first enter their Virtual Classroom. Try to make your use of language both interesting and friendly. Summarize what you are going to do in the course, and tell them what to do first. Exhibits A and B in Appendix I show excerpts from the first few days of entries and interaction in two very different conferences, one for undergraduates using the system for the first time and unfamiliar with one another as well, and the

other for Western Behavioral Sciences Institute participants who are "veterans" of many prior month-long seminars on EIES together. In the former case, for the neophytes, much more instruction has to be given on the mechanics of carrying out the assignments, and the initial entries of the students are quite short and generally at an intellectually disappointing level. However, both instructors responded quickly and positively to the first responses from the participants, with the positive reinforcement displayed to motivate others in the conference to join in too.

During the first week especially, give lots of positive feedback to students, so that they know their efforts have been read. Throughout the course, try to make the emotional tone of your communications positive and supportive. Let the students know that while they are expected to use an editor on papers or assignments, a more casual style is acceptable for discussion comments or questions, and that a few typos are okay as long as the meaning is clear. Consider establishing a separate conference for informal chatting online. For instance, Connected Education on EIES includes a "cafe" where students and faculty as well as other members of the system talk about current events, restaurants or travel, or any other topic of interest.

Remember, especially at the beginning, to use welcoming phrases ("Great to see you onboard and participating in the class, Ellen!"). Use first names to establish a climate of informality. Keep directive statements sparse and light-handed. Use some self-deprecating humor if that feels comfortable to you, and model peer behavior by exposing some of your personal characteristics, feelings, or experiences (Harasim and Johnson, 1986).

Making Expectations Clear

A syllabus or course outline showing the schedule of topics, readings, and assignments should be entered as one of the initial entries in the course, mailed to students, or handed out at the face-to-face meeting. While a sequential set of topics or modules is the most common form of organization, the instructor may decide alternatively to structure the course as a limited set of "multilogues," or activities and discussions that are to proceed simultaneously; if this is the case, also make that clear, as does Jay Forrester in his initial conference comments shown in the Appendix.

For courses organized in terms of modules or topics, you should establish a regular rhythm of activities and deadlines, so that students know how to plan their time. For instance, you might regularly enter material on a new unit over the weekend, and give them until midnight the following Monday to finish all assignments for a unit. If you are on a system like EIES which is busiest on Mondays, consider entering new materials on another day such as a Thursday, with the deadline for completion the next Wednesday night. If there are two or more courses being offered for which students are using the same microcomputers, make sure that they do not have the same usual deadline day during the week. Generally speaking, it is a good idea in a semester-length course to have modules that are a week or two in length, so that students can establish a regular pattern of participation and activity for each week during the course.

"Exhibit C" in Appendix I shows a typical entry by an instructor in the Virtual Classroom project who received very high ratings from

the participants. Notice that there are some informal comments (e.g., "Hope your spring recess was wonderful!) mixed in with the clear list of expectations for the next segment of the course.

SUMMARY: GETTING STARTED

1. ASSURING ACCESS

A. FOR INSTRUCTOR

HOME PC ACCESS

SEPARATE PHONE LINE INSTALLED

FIRST PARTICIPATE IN SOMEONE ELSE'S COURSE

THOROUGHLY MASTER MECHANICS OF SYSTEM BEFORE YOU USE IT TO TEACH.

B. FOR STUDENTS

CHECK NUMBERS OF PC'S, MODEMS, PHONE LINES, PRINTERS, COMMUNICATIONS SOFTWARE, HOURS AVAILABLE

TRAIN ASSISTANTS TO GIVE HELP WITH DIFFERENT TYPES OF EQUIPMENT

2. COURSE DESIGN AND PREPARATION

PREPARE AND STORE FIXED MATERIAL

CHOOSE STRATEGIES AND STRUCTURES

3. INITIAL ACTIVITIES

WELCOME AND ORIENT

CALL "NO SHOWS"

SHORT SIMPLE ASSIGNMENTS

IMMEDIATE POSITIVE FEEDBACK

MAKE EXPECTATIONS CLEAR

ESTABLISH PREDICTABLE CYCLES

USE FRIENDLY LANGUAGE AND HUMOR TO BUILD COHESION

THE INSTRUCTOR AS DISCUSSION LEADER AND ORGANIZER

A class conference is an exchange of ideas and information. As with any group discussion, the leader needs to engage in several kinds of behavior that will facilitate the group's participation and productive collaboration.

One set of experts about online faculty behavior that is conducive to an exciting and productive learning experience is students who have taken several courses online, and who are, thus, in a position to generalize about desirable types of instructor behavior.

Students in the Western Behavioral Sciences Institute's School of Strategic and Management Studies are practicing executives, many of whom have advanced degrees. Those who had taken at least six of the month-long seminars were asked to complete a questionnaire aimed at pinning down just what makes a "good" online course. It included this open-ended question:

> "Suppose a new WBSI faculty member were to ask you for advice on teaching online. What is the one most important thing that a faculty member should do to facilitate a good learning experience?"

Below are the students' replies. Note that they emphasize, over and over again, RESPONSIVENESS. Several comments also touch upon the need to be competent online, and also to organize the interaction. In the sections which follow the advice from students, the themes raised will be expanded upon.

(Verbatim) Advice to Faculty From Experienced WBSI Students

> Be responsive, Keep comments short, be flexible - not stick rigidly to a predetermined outline. Try to guide discussion towards some consensus if you can, but don't panic if you can't.

Frequent, direct responses. Directed questions relevant to topic or readings. Interact with student ideas. Put students together on-line.

Stimulate responses by providing unique or oblique alternatives.

Respond to or acknowledge in some way on line the comments made by each participant.

Learn to type (use the system), write a lot. Respond to each query or comment in timely fashion.

Be responsive in a substantive way to what is said by others.

Encourage specific responses or comments.

Know the stuff, give positive responses/recognition to member comments.

Reinforcing feed back; have supplemental reading material available via +READ .

Make concise presentation of points, be responsive to comments and alternative viewpoints, and encourage those students who are lurking to comment.

Ask questions & genuinely respond to answers.

All the things you'd do off line. Ask questions, and private messages, use telephone, respond.

Recap (Summarize a sort of where we are, once a week) and respond.

Promote interaction.

The Instructor as Discussion Leader

The key activity in the Virtual Classroom is the exchange of ideas and information among students, with the faculty member as an organizer and facilitator of the activities and discussions. The minimum amount of time devoted to a topic area should be at least a week. Otherwise, there is not sufficient time for participants to read the initial materials presented by the instructor, compose their responses, and engage in a discussion based on the variety of student contributions. This may mean that you must choose to focus more "in depth" on a smaller number of topics or modules than you would cover in a face-to-face course that meets two or three times a week. As

Robert Meinke points out in his course report, in the traditional classroom one can skim quickly and sequentially over a number of topics in a single hour-long session. Trying to treat a number of topics simultaneously in a Virtual Classroom is likely to be confusing.

Harasim (1987, p. 123) describes the following kinds of instructor moderator activities, which should be applied to any class discussion:

.Introducing the discussion topic by relating it to readings or other course materials, and clearly posting the issue or question to which the students are to respond.

.Probing, as in an unstructured interview situation, to get students to expand and build upon comments made by themselves or others.

.Providing Information: As the subject matter expert, the teacher should talk about studies or sources or facts that can help shed light on the issues raised in the discussion. Provide short "electures" (electronic lectures) which supplement the printed materials assigned to the class to read.

.Integrating or weaving the discussions by synthesizing points which students raised, building upon and developing themes which emerge, and linking them to the literature and the topic.

.Asking questions and raising issues, based on contradictions or inconsistencies or gaps created by the student's contributions.

.Focussing the discussions on crucial points, prior to wrapping up a topic and moving on.

.Coaching students on communications skills. Note if some of them are constantly making entries that are difficult to read because they are full of control characters, poorly formatted, or badly edited. If you notice this, point it out to the student, suggest

that he or she always look at their entries before signing off, and edit entries if they are hard to read. Try to put this in a positive frame of reference by noting that their good ideas might get more response from others if they were easier to understand.

The course leader has to stay flexible and tuned into the dynamics of the group, above all. If a discussion is going well, do not cut it off arbitrarily, just to fit a pre-determined syllabus. (See, for instance, the admirable example of moderator non-intervention by WBSI instructor Harlan Cleveland, in Exhibit D in the Appendix.) If there is no fixed set of materials that must be covered in a certain period of time, let the lively and successful discussion roll on, without distraction. In a course that has a fixed syllabus, let it continue while simultaneously introducing the next topic or activity. In the latter case, where several things are happening simultaneously and become inter-woven in time sequence, it is especially important to provide some organizational cues and tools for the participants.

Often, students are so interested in the topic being discussed that they do not want to stop when the course is "over" according to the calendar. Plan for this contingency and try to allow a few extra weeks for the course to wind down after it is officially ended, if possible.

Organizing Material and Keeping Track

As material builds up, there is a problem in finding and reviewing old entries and keeping track of all that is going on, unless you establish some procedures at the beginning to help with this. You might consider making an index in the first comment that is updated weekly. The index might include a list and location for all "lectures," assignments and activities. Use keys on all items,

and encourage students to also use consistent keys and associations so that it can be easily seen from the headers which items belong together. Use your ability as a conference moderator to add or modify keys if they are missing or incorrect; then send a message to the student explaining what you have done, and why. On EIES, the DKEYS (Display Keys) command can be used to automatically compile an index by key word, but this only works if the keys are consistent.

To keep track of assignments, consider using special software routines such as "Handin" and "Grader" on EIES (Gleason, 1987). Alternatively, instruct students to use specific keys on each assignment, (e.g. "Assignment 6/ Polynomials") so that you can find them easily.

The "branching activities" constructed on EIES appear to be very valuable in keeping a course organized. Even though they were very "buggy" and slow as initially implemented, those instructors who used this software were sold on the advantages of the approach, and those who did not were sorry. For example, Robert Meinke concludes, "Branching should be introduced as early in the course as possible. It is the only way to maintain a sense of order and encourage creative interaction."

Make your own conference entries relatively short (25 lines is good because it fits on one screen; 50 at the most) and on one topic. Use a separate comment for each separate subject. This also facilitates review and reorganization of the proceedings by students; encourage them to do the same thing. If an item is going to be longer than about 50 lines, enter it in a different format that can be retrieved on demand, such as a "read branch" or a "+read" document on EIES.

Some students will fall behind, due to sickness or other

problems. Review conference status and available data such as last sign on to stay aware of "absentees." If you use Branch Activities for all assignments and sub-discussions, their late entries can enable them to catch up without disrupting the flow of the current conference topic.

Consider establishing separate conferences for distinct activities. For example, the Management Laboratory on EIES had one "general discussion" conference for all class members, and separate conferences and notebooks where each simulated company carried out its work. In Computers and Society, a second conference was established for student-led presentations and discussions on reviews of professional journal articles in the field, separate from the instructor-led main conference. Connected Education has a "Cafe" for informal discussions among students and faculty members from all its courses.

SUMMARY: THE INSTRUCTOR AS DISCUSSION LEADER

1. INTRODUCE EACH NEW TOPIC AND CLEARLY DESCRIBE ISSUES AND ACTIVITIES FOR STUDENT RESPONSE.

2. TIMELY, FREQUENT RESPONSES TO STUDENT COMMENTS AND ASSIGNMENTS.

3. BE FLEXIBLE: LET LIVELY DISCUSSIONS CONTINUE.

4. ASK QUESTIONS, RAISE ISSUES.

5. RECAP AND WEAVE RESPONSES.

6. ORGANIZING-- USE:

   KEY WORDS OR TITLES FOR ENTRIES

   BRANCH ACTIVITIES

   SEPARATE CONFERENCES

   SHORT, SINGLE-TOPIC COMMENTS

   INDEX

TECHNIQUES FOR STIMULATING ACTIVE PARTICIPATION

Techniques related to success in the Virtual Classroom have to do with stimulating a form of participation which is very difficult within the traditional classroom: the active engagement and participation of all students in a collaborative learning community. Though CMC can be considered to be a "narrow-band" medium of communication, the fact that materials are written and searchable, and that communication is asynchronous, also opens up new possibilities for enabling all students to actively participate, at their own pace, in dealing with the concepts, skills, and ideas in a course. As Harasim (1987, pp. 118-119) puts it, "The electronic medium opens new educational options for both learners and teachers, not only in expanding educational access, but also in redesigning teaching strategies and learning activities. " The most basic redesign is to think of asking questions and stimulating student activities to find and share "answers," rather than "giving all the answers. " Though students may derive some benefit from simply reading materials online, conferencing as a mode of course delivery can only provide its full potential benefits if students actively contribute to a group learning experience.

Active participation is an objective that may be difficult or impossible to elicit from all students. To some extent, active student participation is a matter of students being made comfortable with the medium, but it is also related to cognitive maturity (Perry, 1970; McCreary and Van Duren, 1987). The spectrum of type of student participation ranges from "absentees" who seldom or never sign on even to receive waiting material, through "read-only" participants,

to those who make a few comments, to those who make regular scattered contributions, through those who are regularly actively involved in contributing to the course, often on a daily basis. The level or quality of student contributions ranges from the illiterate and incorrect to the truly insightful and skillful presentation of ideas.

Generally speaking, students at an upper-level undergraduate or graduate level have attained a level of cognitive maturity and writing skill which pre-disposes them to active and highly readable engagement with ideas and new skills. The cognitively immature student tends to want the faculty member to "give the right answer." There may be an intermediate stage where students discover that different books and authorities give different "answers," and feel that "there are many different and equally good answers, including mine." The cognitively mature student has learned to critically analyze and apply alternative theories or techniques, and to develop criteria for judging which are the relatively better and relatively poor "answers." A skillful faculty member can lead the cognitively immature student toward a more critical and active involvement with course materials as part of the learning that takes place. If none of the students start out with a level of cognitive maturity and writing skill that facilitates active involvement, this will be a difficult process to get off the ground, but not impossible.

Compare, for instance, the levels of cognitive and stylistic skill evidenced in the initial entries by students in CIS 213 (Exhibit B) with those by the mature and CMC-experienced students in Jay Forrester's Western Behavioral Sciences course (Exhibit A). There is simply "no comparison." The instructor might feel discouraged by initially sparse and not very brilliant comments by students. However, by the end of a semester, students who started

out with first comments just like those in CIS 213 were making mature and well-written contributions such as those that can be seen in Exhibits E and F.

On the other hand, Exhibits E and F are from courses in which the students were at least Sophomores. Below a certain level of ability, motivation, and competence with microcomputers, the Virtual Classroom approach is not recommended as an educational delivery mechanism. Robert Meinke and Lincoln Brown give detailed accounts of problems with freshman-level courses at Upsala. As Prof. Meinke comments,

> Online courses emphasize those very skills in which many of our students are most lacking, reading and writing. Reading and comprehending a textbook is very difficult for many, and the online course intensifies this difficulty by requiring even more reading. Further, it eliminates the very means by which many students actually do their learning, through the spoken word. For this reason alone I believe that online courses are most adaptable to advanced courses where students are experienced and more likely to come with better developed study skills.

Anthropologist Kendy Rudy sums up her observations of the interaction of the medium with student characteristics as follows:

> Students are like themselves, only more so, when online. The chatty ones write long responses, the worriers modify their messages, the dutiful ones do what is required reliably but without brilliance, and the irresponsible are conspicuous by their absence.

Stimulating Active Participation

The following are some techniques which may aid students in becoming actively involved in making contributions to an online course.

(1) Requiring Regular Participation: For the cognitively immature or the poorly motivated student, it may be necessary to present activities which force the student to sign online and participate regularly. One such mechanism is the weekly quiz, which must be taken during the indicated week, and is then "closed." This

typically makes the student sign on at least twice a week- once to get the new material and assignments, and once to take the quiz based on the reading assignment. Without at least twice a week participation, an active dialogue is not possible; the quiz is an admittedly authoritarian type of mechanism for forcing participation, but one which may be helpful for cognitively immature students and those who lack self-discipline. If the quiz is objective, it can be automatically graded and the answer returned immediately, during the same session, thus giving the student some immediate feedback on how well the facts or concepts have been mastered. BJ Gleason's report on Computer Science and Robert Meinke's report both conclude that weekly quizzes worked very well as a mechanism for motivating regular participation.

(2) Making Material Relevant: Ask questions or make assignments which enable students to connect the course materials to current events or to experiences in their own lives, and to respond on that basis. For example, in a statistics course, the idea of probability estimates was introduced with a problem having to do with a current baseball World Series. In a Sociology course, the concept of role conflict was explored by asking each student to describe an incident of role conflict and its resolution that had occurred in their own life, using a pen name to protect privacy.

(3) Response Activities: The response "branch activities" on EIES were developed to force active participation. When a question is asked in a response branch, each student may be forced to independently enter a response to the question, before being allowed to view the responses of other students or to see the summation and integration of the different responses by the instructor.

(4) Conflicting Opinions: Two instructors from different disciplinary or theoretical backgrounds may present conflicting points of view or arguments for different techniques in the conference, with the students asked to respond in terms of which they think is more applicable, and why. Another mechanism is to set up a debate, in which the students form teams and/or are challenged to critique one another's opinions.

(5) Responding and Weaving: Instructors should explicitly respond to contributions by students. They need not respond to each one individually. Even better is to respond to several at once by weaving them together, summarizing, and posing a further question based on previous responses. Students should be referred to by name.

(6) Request Responses: In the conference or in private messages, instructors may urge specific students to respond to specific comments or issues, based on knowledge of their relevant experiences.

(7) The Simulated Agent Provocateur: An instructor can use a pen name to question or challenge an entry which he or she made, thus setting an example that the students may follow and/or setting up a debate. If the instructor makes such a pen named entry, he or she should follow it up shortly afterwards with an entry explicitly thanking the pen-named entity for the comment. Great fun!

(8) The Visiting Expert: Guest "lecturers" may be invited in for a period of time to present material or case studies. Students may be asked to each present one question to the guest, and be graded on the quality of the question.

MIXED MEDIA COURSES

It is assumed that all CMC-based courses are multi-media in the sense that text books and readings and other print-based materials are used by students. Lengthy materials available in print should be distributed that way, not put into a computer system to be read on a CRT.

However, CMC can be used to supplement courses delivered primarily face-to-face or via distance education modes such as audio and video. For example, it has been used to:

- .Serve as a "Bulletin Board" where updated information on assignments or exams is posted for students to check between classes.
- .Act as "electronic office hours" for students to communicate with the instructor.
- .Serve as a medium for students to hand in assignments and receive feedback; in some cases, this has extended to thesis advisement or independent study guidance.
- .Conduct public tutorials: Here, questions and answers from students are posted for all to see, on the assumption that if one student has a problem with something covered in class or in the text, other students may also (McCreary and Van Duren, 1987).
- .Facilitate group projects: students may work online outside of class or in addition to other activities or assignments. For instance, in a Freshman composition course, all writing was done online in a small group, and the other students provided feedback and suggestions, according to guidelines given by the professor. In a Business French class, students practiced writing business letters to one another in French, playing the roles of American

Businessman, French Businessman, French government official, etc.

The problem with such "adjunct" use of CMC is that students must see the online segment of activity as important enough to motivate them to sign online frequently. Some will try to get the teacher to repeat in class announcements that were made online; this of course defeats the purpose to a large extent. In some distance education courses, students have been invited to get online and send questions to their instructor if they wish, but it is entirely at their option, and other students are not made aware of or responsible for issues discussed in these exchanges. Under these circumstances, few bother to sign online at all.

If you are going to use CMC in an adjunct mode, make it clear that it is a course requirement, and that you will not repeat verbally for students material which they can find online. State clearly how their grade may be related to the amount and quality of their online activity; undergraduates seem to respond primarily to this motivator ("Will it be on the test?") If there is to be a substantial activity online, e.g., one that will take over an hour, use it to replace a class meeting, instead of in addition to all regular class meetings. Try to have online activities throughout the course, rather than a few scattered assignments that are so far apart that students never get in the habit of signing on at least twice a week, and forget how to use the system between sessions.

Finally, just as with a totally online course, use the medium as much as possible not just as an electronic pigeon for one-to-one communication, but as a medium for group collaboration and activity, that truly extends and enhances the course activities that occur through other media. The "Virtual Laboratory" where the "Imperial Corp" functioned (see Exhibit F) is an example of this: it was an

important collaborative activity which complimented the text and the face-to-face lectures.

Thus far, we have discussed "mixed media" courses in terms of those for which up to half of the activities may occur online, but for which at least half is delivered face-to-face or via video or audio. However, one may also think of mixing media in the other direction. A course which is primarily in the Virtual Classroom may use some face-to-face or other supplements. For example, WBSI uses a week-long meeting every six months to supplement its continuous series of online courses and activities on EIES. Thinking of distance education courses in terms of having initial and final face-to-face sessions may be a desirable option in many cases.

Another example of face-to-face supplementation for an online course is provided by Rose Dios in her description of the Statistics for Technology course. She had optional weekly meetings in the laboratory, where students could work together in "real time" and engage in immediate back-and-forth queries and discussion about how to solve specific math problems. In a subject area such as statistics, it is probably desirable to include some means of interchange that is synchronous. If the students are not located in the same geographic region, this supplement might be in the form of a system such as that developed at Harvard, which uses a simultaneous graphics tablet and audio hookup, employing a PC, for remote "tutoring" sessions in mathematics.

CONCLUSION: IS IT WORTH IT?

You are going to have to work harder in teaching a course online, at least the first time. Even after reading the advice and guidelines included here, to a certain extent, you can only learn to teach online by doing it.

Being a "virtual professor" is a little bit like parenthood. You are "on duty" all the time, and there seems to be no end to the demands on your time and energy. For instance, as I write this, it is 11 o'clock at night, and I just got a frantic message from a student who is halfway through an assignment and needs help. On the other hand, it is also like parenthood in the sense that the rewards are similar. You can have a better opportunity to help minds and skills to grow, and to establish close "mentoring" relationships with many of your students.

One aspect of the virtual classroom experience that is not touched on in the individual course reports is that the technology can also support the growth of collegial relationships among faculty members who are working together in teaching through this medium. During this experiment, we had a conference where teachers brought their problems and observations and offered advice and solutions to one another. Though we met together face-to-face only twice during the academic year, a supportive community emerged, marked by cooperativeness and sharing of problems and solutions. We "sat in" on one another's online classes, exchanged many private messages, and helped one another in dealing with difficult or problematical issues. Both WBSI and the Connected Education faculties also have their electronic "teachers' lounges;" I think they are vital to increasing the enjoyability and effectiveness of the process of learning to

teach online.

"Would I do it again?" asks Kendy Rudy. "Yes," she answers. "All in all, the experience was positive... I am teaching the same course this semester without EIES assignments; I find that something has been lost in communication with and between students. Given a choice, I'd keep the EIES system permanently."

> Enrico Hsu observes:
> The group dynamics made the class an extremely cohesive learning group. Through constant guidance in an informal manner, I was able to get psychologically close to the students... In contrast to the other section of OS-471 that I taught without the benefit of EIES, "virtual lab" has enabled the students to communicate much more freely and with "rich" content...

Robert Meinke concluded that a totally online course in Introduction to Sociology is not appropriate at Upsala, due to the characteristics of the course (an introductory survey of many topics), of the Freshmen students who lacked self-discipline and good reading and writing skills, and of the inadequate equipment situation at Upsala. However, he concludes that

> While I have taken a strong stand against completely converting introductory social science courses to online courses, I am strongly in favor of using online assignments and discussions as supplements in such courses. They have the ability to stimulate creative in-depth exploration of major themes, and they introduce novelty and excitement to the course.

Would it be a good medium for you? Read the full accounts of the faculty members who have taught this way carefully and decide for yourself. If you want a technology that will minimize the time and effort you spend on teaching so that you can spend more time on activities you like better, the answer is no. If you want something that has the potential to increase your effectiveness as a teacher, the answer is yes.

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APPENDIX: EXEMPLARY INSTRUCTOR COMMENTS AND STUDENT INTERACTIONS

The exhibits in this appendix are edited portions of class transcripts which serve as good examples of instructor behavior and interactional dynamics.

Exhibit A: The Welcome and Introduction

At the beginning of any class conference, the moderator-instructor should welcome the students, describe the content and basic procedures for the course, and tell the students what to do first. The excerpts below show Jay Forrester doing this for a WBSI course, with a language style that is intriguing and engaging. Note the style of responding to several comments in one response; in an active conference, this may not only be necessary but also helpful in synthesizing some diverse opinions and entries.

:C1737 CC1 Jay W. Forrester (Jay F.,2916) 2/27/87 12:34 PM L:22
KEYS:/ORGANIZATIONAL DESIGN/MARCH TRIP/

Welcome to Conference 1737, "Concepts of Organizational Design." It is now time for all amphibious types to come out of John Craven's oceans to contemplate what may happen in the future on land. For those who cannot survive out of water, try to put up a periscope for observation and at least be a lurker from the deep. The tour guide for March is planning a trip through possible future kinds of organizations, some dimensions of leadership that were not covered in the February CEO conference, the idea of designing organizations rather than letting them happen, how to increase organizational effectiveness, questions about productivity of the national economy, making organizations a more personally satisfying place in which to work, and a look at why the economy is behaving the way it is and where it may be going.

That is a lot of territory to cover. There may be washed out roads, mudholes, and detours along the way. Indeed, that is too crowded an itinerary for one month, so there will be shortcuts, and some of the advertised attractions may be missed. We will see where the conversations lead.

Some of the ideas to be presented have been well tested, others will be highly speculative. Most of them have not yet penetrated far into the corporate culture. We can debate concepts, validity, and practicality.

We will not divide the month into blocks for the various subjects but try to carry on several themes in parallel. Only after we get started can we judge whether or not that will work.

:C1737 CC3 Jay W. Forrester (Jay F.,2916) 2/27/87 12:42 PM L:13
KEYS:/PUZZLES IN MANAGEMENT/

As a way to start, let me suggest that each of you put in a brief statement of about 15 lines on some troubling or perplexing aspect of management that you feel arises out of social and/or economic interactions. Here we mean management in the broadest sense

of the term--management of : one's own self and relations to job and others; school systems; corporations...

:C1737 CC11 Doug Carmichael (Doug C.,384) 3/ 1/87 11:10 PM L:16
KEYS:/STRUCTURE EXAMPLE/

I once ran a quality of work-life project at the World Bank. We created a more participatory management for a Regional Vice President. All went well for about three months. Then some odd events and the VP got scared and we stopped but studied the situation.

What we found was that this "development agency" was really organized as a factory to produce loans, and participation (discussions of development and more planning) got in the way, because they could only slow down the assembly line.

So I learned a crucial lesson about organizational structure; if you want something good, like participation (because it develops people and would be good for the Bank in the long run) you have to make sure the underlying structure of the organization requires it, and if not, to change that first.

:C1737 CC14 Jay W. Forrester (Jay F.,2916) 3/ 2/87 10:14 PM L:24
KEYS:/WORLD BANK/ORGANIZATIONAL DESIGN/

Reference CC11, CC12, and CC4). The World Bank is so far from the kind of organization suggested in "New Corporate Design" that "participation" probably means very different things in the two settings. What would "Individual Profit Centers" on page 6 and "Objective Determination of Compensation" on page 8 mean in the context of running the World Bank? Certainly it would mean a different and more responsible organization. Perhaps it would mean that an individual would be personally responsible for the success of a loan and for its being paid back. He would receive financial compensation accordingly...

:C1737 CC16 Doug Carmichael (Doug C.,384) 3/ 2/87 11:52 PM L:21
KEYS:/MORE REQUIREMENT TO ACCOUNTABILITY /

Jay, I didn't expect you to take the path you did on the World Bank. What you say makes analytical sense, but how does it fit the reality?

The bank actually pays staff salaries on the interest earned. And all loans have been paid back. The accountability in this regard is quite good. And the staff works like a taxicab company and bank staff go to the countries and try to come up with formidable bankable loans.v

The problem is that because of the tie in with the IMF etc the countries are extremely likely to want to pay the loans back, even when the financed projects fail.

So, as a tight business it does very well, self financing itself and all. But in terms of developmental significance and providing interesting work for its staff it falls way short of its potential.v

So the lesson I see is that good organizational design must heed

to standards of broader human significance than just bottom line.

Otherwise we could have an economy that is doing very well while the people are doing very poorly.

Exhibit B: Some Initial Segments of Introduction to Computer Science

Note: Students' names changed to preserve confidentiality

```
:C213 CC1  VC - BJ Gleason (BJ/VC,213)   1/21/87   3:24 PM  L:55
KEYS:/WELCOME/ CIS 213 ONLINE! /

W  W  EEEE  L      CC    OO   M  M  EEEE        TTTT   OO
W  W  E     L     C  C  O  O  MMMM  E            TT   O  O
W  W  EEE   L     C     O  O  M  M  EEE          TT   O  O
WWWW  E     L     C  C  O  O  M  M  E            TT   O  O
W  W  EEEE  LLLL   CC    OO   M  M  EEEE         TT    OO

 CC   III    SSS         22     1    33
C  C   I    S           2  2   11   3  3
C      I     SS           2     1     3
C  C   I       S         2      1   3  3
 CC   III   SSS         2222   111   33

  OO   N  N  L     III   N  N  EEEE
 O  O  NN N  L      I    NN N  E
 O  O  N NN  L      I    N NN  EEE
 O  O  N  N  L      I    N  N  E
  OO   N  N  LLLL  III   N  N  EEEE
```

Welcome to CIS 213 - Section 15109 - Spring 87 ONLINE!

The Ground rules are simple: This is a class, just like, more or less, one that you would attend normally. The only real difference is that there is no dress code. But many of the normal rules still apply. No cursing, swearing and no telling off color jokes. You must remember, even though it seems that you are the only person online, many other people use this system.

Another important rule: This is an experimental section. In other words, not everything may work properly. If you run into any problems, TELL ME! The only way we will be able to correct the problems is if we are told when they happen.

Finally: There is no such thing as a stupid question. If you do not understand something, ask. You can leave the question in this conference, or send me (BJ/VC,213) a private message.

Well, that's about it. Feel free to roam about the system, and don't worry, you can't "break" anything. Feel free to join other conferences, and there are quite a few, but be sure to follow the rules established by the moderator.

So, relax, sit back, and we will all have a good time.
But most off all - in the words of the Hitchhiker's Guide to the

Galaxy:

```
    DDD    OO   N  N   '    TTTT        PPP    AA   N  N  III    CC
    D  D  O  O  NN N         TT         P  P  A  A  NN N   I    C  C
    D  D  O  O  N NN         TT         PPP   AAAA  N NN   I    C
    D  D  O  O  N  N         TT         P     A  A  N  N   I    C  C
    DDD    OO   N  N         TT         P     A  A  N  N  III    CC
```

:C213 CC3 VC - BJ Gleason (BJ/VC,213) 1/21/87 3:27 PM L:20
KEYS:/GRADES FOR THE COURSE/ A BRIEF OUTLINE /

In this course we will have:

Midterm - 33% of the grade

FINAL - 33% of the grade

The other 34% will be Labs, assignments, and a research paper.

Every week, you will have to answer a quiz. This week it is a sample quiz, but starting next week, they will count. The quizzes before the midterm will be applied to the grade you receive on the midterm, and the quizzes from the midterm to the final will be applied to the final exam grade. So don't miss them!

There will be one quiz a week, about 5 to 15 minutes long. The quizzes will be open book open notes. You can only take the quiz once.

:C213 CC5 VC - BJ Gleason (BJ/VC,213) 1/21/87 3:33 PM L:20
KEYS:/FIRST ASSIGNMENT/

```
 AA    SSS   SSS  III    GG   N  N  M  M  EEEE  N  N  TTTT          1
A  A  S     S      I    G     NN N  MMMM  E     NN N   TT          11
AAAA   SS    SS    I    G GG  N NN  M  M  EEE   N NN   TT           1
A  A     S     S   I    G  G  N  N  M  M  E     N  N   TT           1
A  A  SSS   SSS   III    GG   N  N  M  M  EEEE  N  N   TT          111
```

As discussed in class:

1. change your name

2. enter a nickname

3. send me (BJ/VC,213) a private message

4. enter a comment in this conference, and give me a little background about yourself

5. when your notebook is established, you are to enter it and compose the FORTRAN assignment I gave you in class. You can then run it using the +FORTRAN command.

6. take the sample quiz, using the command +QUIZ, and when it asks where is the quiz, type N213NP10

:C213 CC8 Harry Doe (har2,2440) 1/21/87 8:03 PM L:1
KEYS:/TEST/

Hey Class- G O O D L U C K

:C213 CC24 ralph Doe (ral,2279) 1/21/87 8:17 PM L:3
KEYS:/NO.1/

MY NAME IS RALPH.I AM CURRENTLY TAKING CIS-213+
AS MY TECHNICAL ELECTIVE.+
MY MAJOR IS MECHANICAL ENGINEERING AND I WILL GRADUATE IN MAY 1987+

:C213 CC28 VC - BJ Gleason (BJ/VC,213) 1/22/87 7:00 PM L:2
KEYS:/TEST/
A: 8

a thoughtful wish harry... thank you, and from me, good luck to all...

:C213 CC44 VC - BJ Gleason (BJ/VC,213) 1/22/87 7:28 PM L:6
KEYS:/NO.1/
A: 24

Hey ralph!

Glad you picked this course... You do not, however, have to type a + at the end of every line. It is only needed as the first character on a new line if you want to finish the message!

Keep up the good work!

Exhibit C: The Course Leader Makes Expectations Clear

:C2585 CC185 Rose Dios (ROSEANN,2547) 3/23/87 4:46 PM L:44
KEYS:/WEEKS 9 AND 10/DISCUSSION OF LECTURE/ASSIGNMENTS/

HELLO! Thank you for the kind words - I HOPE YOUR SPRING RECESS WAS WONDERFUL! ... Thank you for correcting my example on the probability of rain during the world series ... this year the victory was ours!

YOUR ASSIGNMENT FOR THE NEXT 11 DAYS IS AS FOLLOWS:

1. READ COMMENTS 185-202 IN CONFERENCE 2585.
2. READ PAGES 129-146 AND 163-171 IN YOUR TEXTBOOK.
3. USE +BRANCH TO ANSWER THE QUESTIONS IN COMMENTS 200, 201, 202.

THESE 3 QUESTIONS ARE YOUR HOMEWORK FOR THIS MATERIAL.

4. TAKE THE SECOND TEST BY USING +QUIZ. THE LOCATIONS OF THE QUESTIONS ARE

N2585NP303
N2585NP304

THE FIRST QUESTION IS ON PERMUTATIONS AND COMBINATIONS.
THE SECOND QUESTION IS ON EXCLUSIVE AND INDEPENDENT EVENTS.
YOU CAN TAKE THE TEST ALL AT ONCE ... OR DO EITHER OF THE QUESTIONS IN ANY ORDER AND ON ANY DAY YOU WISH SO LONG AS YOU DO BOTH OF THEM BEFORE THURSDAY 04/02/87 MIDNIGHT!

5. THE HOMEWORK (3 QUESTIONS) AND THE QUIZ (2 QUESTIONS) MUST BE COMPLETED BY THURSDAY 04/02/87 MIDNIGHT!! THIS ALLOWS YOU ABOUT A WEEK AND A HALF TO GET EVERYTHING DONE!

HAVE A GREAT WEEK!

Exhibit D: Letting Well Enough Alone

Though the instructor should have general plans to integrate a number of comments, and bring a discussion that is flagging to a close and move on to other topics, these must remain contingencies. If other students take on part of the integrative role, and if a discussion is vigorous and productive, then the instructor's intervention will only be frustrating. As WBSI instructor Harlan Cleveland puts it in the following comment, "If it ain't broke, don't fix it!" Note that this particular course had gathered 144 comments in only two weeks. Obviously, the students were engaged in the topics and did not need new stimuli or re-direction.

:C1746 CC145 Harlan Cleveland (Harlan,481) 2/19/87 2:02 AM L:24
KEYS:/MIDCOURSE CORRECTION?/
A: 109

Peter:
In your cc109 your ask, in effect, whether we need any mid-course correction in this teleconference.

I had prepared some provocations in case what you call the polylogue (is that word better than multilogue?) was languishing by mid-month. It isn't languishing. If I added new themes just now, the circuit would surely scream "OVERLOAD." My other option was to try to prepare an integrative summary of the comments so far -- but then Lynne O'Shea rescued me with her wonderfully integrative cc129, with its 30 speculations about the CEO of the future based on this teleconference.

I tend to judge an enterprise such as this conference the way I judge faculty colleagues: if they're not stimulating me when I talk with them, they're probably not stimulating their students either. And vice versa: if I react (with ah-HA, or appreciative laughter) to what they tell me, it's fair to assume that they're stirring up their students too. So far, I'm enjoying you and Brad and John and the WBSI participants very much.

So ... the oldest principle of management applies: If it ain't broke, don't fix it.

.....Harlan.

Exhibit E

Excerpts From Student-Led Presentation And Discussion

(Retrieval from Branch Activity Format Shown)

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BRANCH CHOICE?4;61


C105 CC61  Tal Barnea (TB,2246)    4/14/86  11:04 AM  L:2
(ORIG.)                            4/14/86  10:19 AM  L:2
KEYS:/READ/POETRY AND COMPUTERS/

SHOW ABSTRACT (Y/N)?y
     Do a branch to see the presentation on computers and poetry.


Read material from C105 CC61:
-------------------------------------------------------------------------

1    Computers and Poetry
2    Pro and Con
3    Applications
4    Summary

ITEMS TO READ (#,#-#)?4
 Item: 4
     Viewing all that has been said, I think that there is almost no
doubt about the fact that the computer, although capable of creating
lines that look like poetry, is incapable of creating real poetry
that comes from senses and emotions.  The impact of computers on
poetry should be found in other aspects such as analysis, education,
and freeing the poet to do the creating.
     As a final note, I put down parts of two poems, one written by
man (who???) and the other by a computer.  Can you distinguish
between them? (See respond branch.)

 1. The gray sea and the long black land
    And the yellow half-moon large and low
    And the startled little waves that leap
    In fiery ringlets from their sleep
    As I gain the cove with pushing prow
    And quench its speed in the slushy sand.

 2. The sunrise is coming, breathing but secret,
    Singing or weeping its joy or its terror;
    The planet's impulse is this night's gift:
    Tender, wicked, knowing, now forgotten, now treasured,
    Sometimes buried, sometimes remembered, always grasping
    As we are compelling earth and thighs and fields of violets.
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BRANCH CHOICE?1
BRANCHES TO GET (#,#-#/CR=ALL)?63

C105 CC63 Tal Barnea (TB,2246) 4/14/86 10:51 AM L:13
KEYS:/RESPONSE/POETRY AND COMPUTERS/

GET TEXT OF ITEM (Y/N)?y
Read comment 61 in conference 105 before answering these questions.

1. Can you distinguish between the two poems cited ?
Which is which ?

2. Does poetry created by a computer have any meaning (literally speaking)?
Does it make any sense?
Can computers create real poetry?

3. If you found it difficult to distinguish between the man made poem and the computer made poem, what use is there for poets and the field of poetry ?

RESPONSES TO CC 63 TO GET (#,#-#/CR=ALL)?

Response CC63.1 chantalak lacharoj (chantalak,2375) 4/14/86 9:25 PM L:29
KEYS:/ANSWERS TO TAL BARNEA'S COMPUTER GENERATED POETRY/

1 : I admit that it's difficult to distinguish which poem was by human and which was by computer. I'm not at all familiar with poetry but I could guess that the first one "The gray sea.." was written by computer. Not that I can write better than that but by examining the sentence structure, we can see that all it's doing is picking nouns and adjectives and joins each pair with "and". The second poem is far more beautiful and I guess computers can never come up with lines like that.

2: Computer generated poetry does have meaning and thus can be called real poetry. I even think it's a good poem. It makes sense because I can understand it.
3: The answer to the ethics and esthetics issues is that even though

who can write better than computers, whose works we can appreciate more deeply. I feel that computers are more useful in this field as an aid to a poet rather than being "poets" themselves. As of now, they are better at analysis than generating poems, but surely days will come when one can not distinguish "which is which".

Response CC63.3 ROBERT BLUZE (MAJESTY,2331) 4/15/86 6:18 PM
L:15
KEYS:/COMPUTERS AND POETRY/REPLY TO QUESTIONS/

1) YES I CAN. I FEEL THAT THE FIRST POEM WAS WRITTEN BY THE COMPUTER. THE DESCRIPTIONS SUCH AS THE 'GRAY SEA" AND THE "LONG BLACK LAND" ARE NOT VERY ACCURATE OR MEANINGFUL. THE SECOND POEM SEEMS TO HAVE MORE FEELING AND WARMTH. IT SEEMS THAT THE ONE BY THE COMPUTER WAS JUST TOSSED TOGETHER.

2) COMPUTER GENERATED POETRY DOES MAKE LITERAL SENSE BUT I FEEL THAT IT HAS NO REAL MEANING BEHIND IT. HOW COULD IT, WORDS HAVE MEANING ONLY IF THERE ARE FEELINGS AND EMOTIONS BEHIND THEM, AND SINCE THAT IS NOT POSSIBLE, I WOULD NOT CONSIDER IT REAL POETRY. IT IS A VERY GOOD SIMULATION THOUGH.

3) AS I SAID BEFORE, COMPUTER GENERATED POETRY IS JUST WORDS TOSSED TOGETHER TO FORM SENTENCES. REAL POETRY COMES FROM REAL HUMAN EXPERIENCES AND FEELINGS.

Response CC63.4 Joseph Tagliaferro (TAG,2268) 4/16/86 6:14 PM
L:18
KEYS:/RESPONSE TO POEMS AND COMPUTER/

1) It is very hard to distinguish between the two. But I feel I can give a pretty good estimate which is the computers. The first seems to me to be the computer. It's phrases like: slushy sand, gray sea and black land. These phrases sound like something that was put in, to fill a spot in the poem, with no real thought about what the adjective means. Those phrases are just unclear.

2) No, as I stated above, the computer has no meaning. It just finds a word that will fit and puts it in the appropriate spot. It can not have the ability to have meaning, because it doesn't have any intuition.

3) Not being a poetry major and really understanding what goes into developing a poem, I can only give you my gut feeling. I can not see how an artificial intelligence can have feeling and experience to arrange a piece a poetry so as to make someone sit back and either laugh or cry!!

Response CC63.6 SANJAY PATEL (STICK22,2273) 4/23/86 6:26 PM
L:10
KEYS:/RESPONSE FROM STICK22 TO TAL-BABY FOR POETRY/

Yes, I agree that the introduction of computers in various fields has altered the performance of those in the area and also changed the quality of feedback and information associated with the specific field. Nevertheless, the use of computers in poetry has caused poets(modern day) to be a bit more lazy. That is, with the use of tape recorders and word processors, the same gifted poets of the universe have perverted their thoughts by allowing the machines to do the work. In this sense, the mind is not acting in a creative manner, instead the power of the word processor is taking control over the power and gifted talent of the poet. I do not see a reversal in the trend; that is, I don't see the quality of poems increasing again since people will always , if not to a greater degree, continue to use the computer.

Response CC63.7 Joseph Tagliaferro (TAG,2268) 4/24/86 12:07 AM
L:6
KEYS:/RESPONSE TO STICK22'S RESPONSE/

I don't agree with Sanjay about word processor's taking away from the creativity of the poet. The poet proper still has to write out all his thoughts. The word processor is there just as a tool to help him. It is not controlling his ideas, but just making it easier to copy and move it around and change it, if it has to be.

Response CC63.8 Roxanne Hiltz (Roxanne,120) 4/25/86 3:56 PM
L:13
KEYS:/COMPUTER ASSISTED POETRY RATHER THAN COMPUTER AUTHORED POETRY/

I can also imagine a nice tool for the poet. It would be a kind of rhyming dictionary or thesaurus. you could say that you want a word with X number of syllables rhyming with "blah-blah" and it would give you some suggestions. There is no non-computer based method other than human memory that I know of now which can select for both rhyme and syllables.

At least for the "old fashioned" poets who like to use rhyme and regular meter, this would probably result in better poems. Right now, when I am playing with poems, I often settle for something that does not quite rhyme or does not have the right number of syllables, because i cannot think of a word with the solution to both criteria.

Response CC63.9 SANJAY PATEL (STICK22,2273) 4/26/86 9:25 PM
L:9
KEYS:/HATRED TOWARD THE USE OF WORD PROCESSORS IN POETRY/

YES, THE WORD PROCESSOR IS A TOOL TO HELP THE WRITER. BUT MY CONCERN IN THE USE OF THIS MACHINE FOR COMPUTER POETRY IS THAT THE USE OF THE PROCESSOR PREVENTS THE POET FROM THE EXECUTING THE BASIC FORMS HE PRACTICES IN WRITING POETRY; THAT IS, THE PHYSICAL WRITING AND SCRATCHING OUT OF THE WORDS ON PAPER IS MISSED. ALSO, AS CORRECTIONS ARE MADE, THE PREVIOUS WRITING IS NOT SEEN IF THE PROCESSOR IS USED; HOWEVER, WITH THE USE OF THE OLD PEN,PENCIL, AND PAD THE USER CAN SEE HIS MISTAKES AND LEARN FROM THEM EASIER THAN FROM THE DRAFTS DONE ON THE PROCESSOR SURELY, HE CAN SAVE THE VARIOUS DRAFTS IN DIFFERENT FILES, BUT THE CORRECTIONS AND HOURS OF SWEAT, MUSTARD STAINS AND SCRATCHES ARE NOT APPARENT ON THE PROCESSOR AS THEY ARE ON THE PAD AND PEN.

Response CC63.11 Paul Elder (Cheech,2370) 4/28/86 4:56 PM L:30

I write poetry so I guess it's sort of a challenge to try to figure out who (or what) wrote which poem. They were both very nice works but my vote for the human authored poem goes to poem #2. Please let me know whether I am correct. When I read poem #1 I said, "Hmm, this could have been written by a human." It did make sense. However, when I read the second one I noticed that there was a smoother flow to it, and the image produced by it was more "alive" and descriptive of what it was talking about. If my guess is wrong, well..., then the computer fooled me ! I really doubt it though. I believe that a computer is possible of making phrases rhyme and

matching the rhythm from line to line, but I cannot agree that a machine, no matter how sophisticated, can put feelings and emotions into its output. And even if one day a computer could do such a thing I don't think that it could match a human poet. Although poetry is based on many things that a computer is good at doing (repetition, matching, etc.) and even though it can perform these things faster than a human it doesn't have the source of inspiration that is needed. It doesn't have emotions, or senses. I guess what I'm trying to say is that the computer isn't "man-enough" to write poetry.

:C105 CC103 Tal Barnea (TB,2246) 5/ 2/86 8:28 AM L:13
KEYS:/COMPUTERS AND POETRY/FOLLOWUP/SUMMARY/
A: 61

I am adding a few lines to sum up the presentation on computers poetry. For all those who read it, the first poem (The gray sea ...) which many people thought had phrases with little meaning put together by a computer , was actually written by a human poet named Robert Browning, and is called Meeting At Night. The second poem, which I too found to be more meaningful, was created by a computer. Paul, you weren't the only one fooled, nobody, and I mean nobody, got it right. Maybe David is right in his opinion that it does not really matter what the author meant or felt when writing the poem. What should matter is what we feel when we read it, and if it has a meaning to us or it "moves" us then why should we care who or what wrote it.

Exhibit F

Excerpts From Student Discussion of MIS Requirements for "The Imperial Corporation" Simulation

:C2024 CC140 Paul Yurga (Yogi,2212) 3/28/87 12:54 PM L:19
KEYS:/MIS/REQUIREMENTS/MARKETING WEST/

MIS Department,
This is a brief description of the features that I believe are essential to the functioning of my Department (Marketing West). First of all, I will need a database manager to keep track of appointments, companies to be visited, companies already visited. It will have to maintain records on all Marketing campaigns.
Secondly, the system will have to be able to keep me up to date on all of our figures--Unit cost, Selling price, Maintenance costs, latest sales figures, quantity on hand, etc. We have to know what we are working with before we go to try and show it off.
Lastly, the system will have to keep up to date with the latest sales figures so that I can formulate a strategy as to my next prospective buyers. If I know who has been buying lately, I can attack more of them. I can not think of anything else off-hand, but I'm sure I'm missing some major needs.

Thank You
Paul Yurga
(V.P Marketing West)

:C2024 CC148 Grace Crisafi (Gio,2046) 3/30/87 11:12 AM L:29
KEYS:/MIS/PERSONNEL DEPT./

TO: Imperial Computer Company President, VP's and managers
FR: Grace Crisafi, Personnel Manager
RE: MIS system in the Personnel Department

The MIS system in Personnel only needs to comprise the following:

1) A huge DATABASE (in the form of a mini-computer, not sure?) in order to contain all the employee files.

2) Four computers (two in the Personnel Dept. and two in the Records Dept.) that can access this employee DATABASE.

3) Four computers (two in Personnel and two in Records) mainly used for wordprocessing functions.

4) Finally, the two wordprocessing computers in Personnel will be equipped with modems in order to communicate with various employment agencies so as to keep an up-to-date account of potential employee prospects. A modem can be very useful in my department since we can also keep the employment agencies informed of openings as they occur - this should prove to be a much more efficient and speedy system than the old process of advertising job openings in newspapers and waiting for responses.
Of course, job openings will still be advertised in papers for the general public. However, I am all for electronic

communication with employment agencies and even agencies such as Affirmative Action and EEO.

:C2024 CC152 PAUL BLUME (Ozzy,2027) 3/30/87 12:44 PM L:22
KEYS:/MIS REQUIREMENTS/

FELLOW EMPLOYEES,

AS I WAS LOOKING THROUGH THE MESSAGES I CAN SEE THAT WE ARE MAKING GOOD PROGRESS.I THINK RON DID A GOOD JOB ON OUR BREAK-EVEN POINT AND OUR COMPANY DID A GOOD JOB IN GETTING STARTED THAT WE CAN MAKE A PROFIT AFTER 4 MONTHS.

I WOULD LIKE TO EXPLAIN THE MIS REQUIREMENTS FOR MY DEPARTMENT (MARKETING-EAST COAST). PAUL YURGA HAS ALREADY PUT HIS IN. SINCE HE IS IN CHARGE OF MARKETING IN THE WEST COAST WE HAVE BASICALLY THE SAME NEEDS BUT I WILL TRY TO RESTATE THEM IN DIFFERENT WORDS.

FIRST,I THINK IT WOULD BE A GOOD IDEA IF PAUL'S SYSTEM AND MY SYSTEM WERE HOOKED TOGETHER SO THAT I COULD GET AN OVERALL PICTURE OF WHERE OUR PRODUCT IS NEEDED. IF WE AREN'T SELLING SO GOOD IN THE EAST I COULD SHIP SOME COMPUTERS TO THE WEST.

BASICALLY,I WOULD NEED A COMPUTER TO SEE HOW MY SUBORDINATES ARE SELLING THEIR PRODUCT IN THEIR SPECIFIED AREA TO BE ABLE TO DISTRIBUTE EFFECTIVELY. THIS COULD ALSO TELL ME IF WE NEED TO IMPROVE OR CHANGE OUR ADVERTISING SCHEMES.

ALSO, A COMPUTER COULD GIVE ME LISTINGS OF NEW BUSINESSES AND SCHOOLS THAT COULD BE POTENTIAL CUSTOMERS. THIS WOULD BE AN IMPORTANT PART OF EXPANSION OF OUR COMPANY.

APPENDIX II: COURSE REPORTS

The following is an outline of the topics which instructors were requested to include in their case histories of experiences teaching online.

1. Description of the topics covered in the course; with a kind of syllabus-outline of what was covered week by week.

2. Description of the materials and activities you provided for your online class (type, length, frequency) (or class segment) How did this differ from ftf class materials, activities, and scheduling, and why?

3. Description of what worked well in terms of students seeming to learn and to participate, and what the major problems were... things that did not go over well.

   You might include here problems with procrastination (uneven and delayed participation); with software or hardware inadequacies; with getting students to actually actively ask questions or discuss issues. Try to also include a section on any "group" or "collaborative" learning activities; how these worked and how they did not.

4. Reporting and if possible (if you have easy access to a stat pack) analysis with t-tests of any differences between comparable grades.

5. How do you, as a faculty member, feel liberated and/or constrained by the fundamentals and/or particulars of EIES? What sorts of teaching strategies would you try next time, and, conversely, what kinds of teaching seem so constrained or distorted by CC as not to be worth the effort?

VIRTUAL CLASSROOM REPORT

RESULTS OF TEACHING CIS 213 ONLINE FOR A SECOND TIME

INSTRUCTOR: BJ GLEASON

In this report, I will compare the experiences I had while teaching Introduction to Computer Science for the virtual classroom over a period of two semesters.

The class being offered is CIS 213, Introduction to Computer Science. This is a core course, required by majors and non-majors alike, as well as graduate students entering the Master's program. The course covers many topics in Computer Science, as well as programming, in the FORTRAN and Pascal Computer languages. Provisions were developed to allow these programs to be done online.

The first semester that I taught was the hardest. The first major stumbling block was the lectures to present to the students. To obtain the lectures, I recorded my face-to-face class, and then transcribed it. It was a lot of work. I would even sometimes cut the online lecture short to get it to the students on time.

The second problem was gauging the students reaction to the material presented. The students would read the material, and very few would ask questions. In a face-to-face class, there were more questions asked, and I could judge the class on a whole to see if the material was getting through to them. This is very difficult to do online, since this form of contact is completely

lost. In response to this, I developed a +QUIZ facility to give the students a quiz each week. I could then tell via the quiz results if the material was being understood.

Another problem was getting homework assignments organized. In a face-to-face class, I would have a folder for each assignment. Online Students would send me an assignment as a message, which I could not place into a file, so again, a program was developed to allow a notebook page on eies to serve as a file holder.

Finally, a major problem was the FORTRAN and Pascal compilers. There was little documentation that could be distributed to the students on them, and the interface design was slow and unreliable. There were many times that the program just got "lost". This resulted in anger and frustration on the part of the students.

In short the first semester was long and tiring. But many of the problems faced were organizational. Once these problems were solved, the second semester would flow easier.

During the first semester, I had 9 students. During the second semester, I started with 22 and ended up with 15. While this is only a slight increase in number, it does add to the work load.

My first problem from the first semester was solved. I still had the lectures, and now I even had more time to refine them, and to add in the section that I had originally cut out.

In the first semester, some of the students complained that

the course was too easy. The root of this, I found out, was that many of the students taking this course could read a lecture faster than I could say it. So a two hour lecture online only took about an hour to read. So to pad this out, with out going ahead of the offline classes, I decided to add supplementary materials to the class lectures. The materials were newspaper and magazine articles dealing with computer science. I obtained these and added them in for the students to read, but not to be tested on. The reaction to this was very good. I gave an assignment to the students for each of them to enter an article in the class conference. Many of them entered more than just one. A few even entered extra articles in the conference much later. I found this to be very encouraging. The students were sharing ideas with each other in a way that I never saw in my offline class.

Perhaps the main reason for this, is that when a student enters a comment for the entire class to read, it is not like my standing in front of them to read it. You don't quite get the feeling that you are talking in front of a crowd, but rather just entering a comment into the computer.

Gauging student reaction was done much the same, using the quiz facility. I found, even with the added materials, and the supplemental lectures, the students were still able to keep up without much effort.

A problem which became clearer in the second semester was talking to the students via private messages. Due to the increase in the number of students, the assignments and quizzes, I found I was writing a lot more private messages to the students than in the previous semester.

To cut down on this problem, I developed a number of programs that would easily let me send one line messages to my students. They were automatically addressed and sent, cutting down on my time. I also developed a program to automatically grade the quizzes, and send the results back to the students. This drastically reduced the amount of time spent online correcting and mailing grades to the students.

A package that was developed during the mid-semester break between classes was a gradebook program to allow me to maintain the students grades on the EIES system. A subprogram of this was developed to allow the students to see their own grades and the class averages, without seeing the other student's grade. This drastically reduced the number of queries I got on "How am I doing in the class?"

The problems that we faced with the FORTRAN and Pascal compilers were also taken care of. This resulted in much more reliable output, and more predictable run times.

The virtual classroom project is far from complete. Still in the works is a program to allow students to take exams on EIES. In the original plans, this was supposed to be available during the second semester, but I found too many limitations with the current version of EIES to allow for proper implementation of the program. Since the Virtual Classroom project is being ported over to a vastly improved version, called TEIES, I have many hopes that the exam program will be available for the next session of virtual classroom students.

In summary, I found the second semester to be easier than the first. The mind numbing task of transcribing my lectures was gone, but an increased number of students added to the amount of online time required to answer all the messages the students were sending. The further development of the support programs also eased the burdens on the instructor and the students. By reviewing what had gone wrong (and right) during the first semester, programs and techniques were developed and corrected.

On the whole, I felt that the second semester of CIS 213 was a much smoother and more pleasant experience for the students and teacher.

INTRODUCTORY SOCIOLOGY WITH EIES

Robert J. Meinke

MY PREPARATION

When I was asked to teach this Introductory Sociology course online, I had previous, but limited, experience using the EIES system. For several years our Sociology/Anthropology/Social Work Department at Upsala College had been using it for departmental communication and, in addition, I had briefly participated as a student in an on-line course given through EIES.

In the summer of 1986, I began the preparation of my course lectures and assignments and soon discovered that there were many things about the system with which I was unfamiliar; in fact, even my facility in using those procedures with which I had previously worked was limited. To complicate things even more I had been provided with a new microcomputer for teaching this course, one which was entirely unfamiliar to me, required much experimentation, and produced much confusion. Therefore, the first month or so was absorbed in coping with the mechanics of computing and the EIES system and often resulted in great frustration.

COURSE CONTENT

The first question that arose in my mind when faced with adapting my Introductory Sociology course for on-line was, could the students cover the same amount of material that they usually did? It seemed to me that probably they could not. Certain constraints existed on-line that were not present in the traditional introductory course; even more, perhaps, than would be present in an advanced upper level course.

The reason was this: Introductory Sociology courses are survey courses; they cover an extraordinarily broad range of diverse topics. Most chapters in the text are fairly discrete and self-standing. While there are broad theoretical perspectives that more or less link the topics together, only some of the topics are related to each other in a step-by-step logical interrelationship. Further, each chapter summarizes the principal sociological findings about its topic and requires the student to master a great deal of detail.

In the normal classroom situation, it is possible through a mix of lecturing and quick oral review of the chapter content to reinforce this broad range of material and to quickly detect areas of confusion. Computer conferencing, on the other hand, seemed to limit my ability as instructor to cover these extensive and detailed amounts of material quickly, if at all. Especially did this seem to be true when the conference members would be mostly young freshmen and sophmores inexperienced in this mode of communication and frequently lacking in basic college study skills. A new chapter a week had to be the usual pace, and this meant that about twelve to thirteen chapters must be covered in a semester. Conference discussions and responses, being asynchronous, seemed more adapted to very intensive, creative analyses of a few broad issues rather than an extensive, detailed coverage of many.

Why? In the first place, in a face-to-face class, lecturing can serve several resent a more in-depth discussion of an important topic than the text does; to discuss the same material as the text but from a different and, perhaps, more meaningful angle; and finally, and especially, to provide an alternative mode of communication, an auditory one in constrast to the written word. This latter purpose is vitally important with freshman and sophmore students who today

are frequently very unskilled in comprehension reading. While lectures in a computer conference are certainly able to serve the first two purposes, they are totally unable to handle the third.

Secondly, it seemed to me that computer lectures would best serve these inexperienced students by being fairly short, a page or two at most; otherwise, fatigue and overload would likely occur. Also, the number of them submitted each week should be carefully limited and emphasize only the most important points. Unfortunately, the result of this policy would be to heavily depend on the students themselves to master most of the detailed material from the text, something that most of them are not very good at doing.

Thirdly, if lectures must be short and limited, then the majority of the on- line time would be mostly used for assignments and discussions. Here again, however, the emphasis would be on intensive rather than extensive coverage in a course where extensive coverage is essential. Of course, assignments whether on or off-line are always intensive. Most are usually designed to force the student to apply some specific concept or area of knowledge to life situations or to think through the logical implications of an idea. On the other hand, discussions in an off-line class can be very flexible, quickly shifting from one topic to another, quickly leaving behind what is well- understood, and then again becoming very intensive on a particular area. This flexibility is very important but depends on the condition that the group is gathered together in one place and time and allowed to interact spontaneously. On-line discussions are not like this. People enter their comments at different times creating significant time gaps in the dialogue. This has the advantage of encouraging more considered and thoughful responses and discussion, and, at best, leads to in-depth exploration

and creative interactive thinking. To do this, however, requires lots of time, and in a course where a new chapter is introduced weekly, the discussions must be limited in number and truncated to make room for those of the next week.

Fourthly, in each face-to-face class hour it may be possible for the discussion to explore several different topics, not in depth, but sufficiently for some students to gain reinforcement and better comprehension. While it is certainly possible on- line to carry on several simultaneous discussions with different themes (especially with a branching capability), this seemed to me to require a level of thinking and conferencing skills far beyond what could be reasonably expected of beginners. So, again, this meant that at least in the early weeks of the course the amount of discussion in any one week would have to be limited to one or two themes. My later experience confirmed this impression.

Thus, I tended to see a basic conflict between the need to cover a constantly changing, extensive content and the use of a communication mode that encouraged in-depth, exploratory discussion. It would certainly be possible, and in many courses highly desirable, to emphasize this latter capability. This would definitely be true if the course were intended to aim at the exploration of one basic theme as many advanced sociology courses do, but I was teaching a course in which mastery of a broad, detailed and specific content was expected no matter where it was taught or by whom. As a compromise I decided to structure the course by entering into the conference each week the following items: a set of learning objectives (which would also be the basis of the exams), one or two minilectures, one or two assignments, one or two discussion questions and an objective quiz.

SELECTION OF STUDENTS FOR THE ON-LINE COURSE

Any assessment of the on-line course must take into consideration the characteristics of the students. It is possible that the way the students were recruited influenced their characteristics and, therefore, the course outcome. Unlike the regular off-line course, there was great concern up to the last minute as to whether there would be enough students registered for this course to run. On the one hand, the Dean normally required that courses have a student body of at least seven or eight, and on the other, the purposes of the experiment required enough students to make a meaningful comparison with the regular off-line class which already had nineteen. Registration was almost complete, and we had not met these expectancies. Definite attempts had already been made to publicize the course with the faculty and student body. A detailed course description had been submitted with the early registration materials. Later posters had been prepared and placed around the campus by the administrative assistant of the project. However, the pre-registration results indicated that little interest had developed. As the registration period drew to a close, an unusually vigorous attempt was made by some advisors to encourage students to sign up. The result was a final register of sixteen, but, I suspect, it contained only a few who chose the course out of tremendous interest, and a large number who needed a last minute course or were attracted by the fact that there would be no face-to-face class attendance. It also included one high school student who had been given special permission to register.

This experience demonstrates the tremendous importance of publicity when preparing to give an on-line course. Afterwards we realized that many of the Upsala faculty had had no, or at best, a very minimal awareness of the proposed experiment even though

materials describing the course had been distributed. Thus, most of them had made no attempt to suggest the course to their advisees.

Of the sixteen students who finally did enroll, six dropped out of the course either officially or unofficially by the end of the semester. No students dropped out of the off-line course. Of the dropouts, one immediately withdrew after the first training session when he realized the amount of work required; another went on vacation the week after the course began and, upon returning, decided that she could not catch up; another became ill and gave up about half way through; still another entered the first assignment and was never heard of again; another entered only five assignments and then disappeared; and the last one did only two assignments and refused to come online, but did take the two exams and failed both of them. In all these cases several attempts were made to communicate with the students by phone or letter and encourage them to continue, but to no avail. THE TRAINING OF STUDENTS IN EIES

This course was designed so that the only formal face-to-face contact with the instructor or with other students was to occur at the first meeting, the mid-term exam and the final exam.

The first class meeting was intended to acquaint the students with the nature of the course, its requirements and the EIES system. At this meeting, a number of xeroxed items were handed out: a course syllabus, copies of two articles to be used in later assignments; and an instruction sheet for mastering the basic EIES skills of sending private messages and conference comments.

After a brief initial question and answer period, the class adjourned to the computer lab for hands-on instruction. Because of the very limited number of terminals yet in working order, three or more students gathered around each terminal with one actually

operating the equipment. Professor Hiltz announced each step by step procedure, and two of her assistants from NJIT and myself moved from group to group assisting those who needed help. As soon as the first student had entered the directory and successfully sent messages, the others had their turns at following the same procedures.

The results of the training session were mixed. Some students, the most adventurous and agressive, followed the steps quickly and for the most part effectively. However, the general atmosphere tended to be noisy and chaotic which made it difficult to hear the instructions and keep everyone moving together. Some of the first students rushed ahead without waiting for the next instruction, confusing many of those watching. It was obvious, even in this first training session, that some students wanted to hurry off as soon as possible and not take the trouble to master the details. The result was that the students, when they were later on their own, needed a great deal of help from the lab assistants and took some time to become adjusted.

STUDENT INTERACTION WITH THE HARDWARE/SOFTWARE

Two of the most important factors in the success of an on-line course are the ease with which the students have access to terminal facilities and the degree to which the software meets their communication needs. In the Introductory Sociology course these factors were fairly adequately covered, but far from optimally.

a) Hardware: Terminal Facilities. All of the students, except initally two, were dependent on the use of the Upsala computer labs. Other than these exceptions, none of the students had computer facilities in their homes or dormatory rooms.

One of the exceptions was an adult, fulltime employed, evening student, who had taken the course on the condition that we would supply her with a portable terminal that she could use at home. We did this, but the arrangement did not prove to be satisfactory. Right from the start she did not seem comfortable with the equipment; she would frequently ask for assurance that her messages were being transmitted. Concurrently, she did not seem to grasp the significant issues in the course; her assignment answers often missed the mark. About one third of the way through the semester, she reported that her terminal no longer worked. I requested that she bring it in for my inspection, but she constantly delayed doing so and began going to the lab, but irregularly. Eventually when she did return the machine, we arranged that she could pick up another one at NJIT if she wished, but she never did. Subsequently, her level of participation declined and became more erratic. While she did finish the course, she only earned a D grade.

The other exception was the fulltime high school student. She exhibited facility in using both her equipment and EIES. She was also one of the best students. Unfortunately her other responsibilities interfered at times with her assignments, and her final grade was a B.

Upsala has two computer labs; most of the students used the social science lab which had the greatest number of modum terminals capable of communication with EIES. The other lab, the one operated by the computer department, had only two Teletype 43 terminals (later in the semester there was also one of these available in the library). While the hours in this lab were much more extensive than those in the social science lab, students seemed to be much more comfortable using the machines in the social science lab, probably

because they had been trained on them. Those students who did try to use the Teletypes complained that the machines were often inoperable and that the lab assistants there were not knowledgeable about their use. (The one in the library had no responsible person to whom to turn for advice if a problem developed.)

However, the social science lab also had its problems. When the course began, some of its equipment had still not been installed and some had not been delivered. The available terminals represented a variety of different manufacturers, each requiring a different set of procedures for establishing communication with EIES. Both students and lab assistants, especially in the early part of the semester, often ran into frustrating problems in attempting to get online. Some terminals were more popular than others because of their ease of operation. Students, naturally, became attached to the terminal which gave them least trouble and with which they were most familiar. But because of limited equipment and heavy useage, students were not always able to get their preferred machines. Also machine malfunctioning was frequent enough to be irritating.

Another problem centered on the printers. All terminals did not have a workable printer attached. Breakdowns in operation often occurred and were extremely frustrating; then I would receive complaints that an important lecture or assignment could not be printed out.

Lab assistants were naturally uneven in their skills and technical knowledge. Some were very expert and able to aid students in solving machine problems and even EIES difficulties. Others were not sufficiently familiar with the EIES system to be of much help.

The social science lab's time schedule seemed to be adequate, roughly 10-9 on Monday - Thursday; half day on Friday and Saturday.

The closing on Sunday did not seem to bother most students; very few were ever active on weekends or even Fridays. The only exception was the high school student with her home computer who often entered the conference over the weekend. However, this concentration of activity on Monday-Thursday by most students resulted in quite a few violating the course requirement that each student get on-line at least three times a week. Since few students tended to come on-line two days in a row, many ended up establishing a twice or once a week pattern in spite of my complaints. This caused a greater time gap in entering assignments and responding to discussions.

The lab hours were usually maintained, but I did receive several strident complaints from one student who had a pattern of going to the computer room first thing in morning and sometimes found that the lab assistant did not arrive.

b) Software: The EIES System. The EIES system proved to be an excellent medium for this course. After some initial confusion and additional advice, all the students did master the basic procedures required. The system with its diversity of available options did provide flexibility in teaching.

The one most annoying difficulty with EIES was its slowness. This definitely frustrated students and interfered with creativity. Like failures of equipment, the seeming interminable waiting distracted from the learning goals and made concentration difficult for both the students and myself. While this course was in session, so were many other courses using the lab; this combined with the normal EIES load made for many long waits. These delays were magnified during the most busy daytime hours, especially during midday. Unfortunately, those were also the most popular hours for students. Since many students avoided coming back on campus at night

and few had home computers, many did not avail themselves of the night hours when access was often easier. I, myself, found it so frustrating to go online during the day that I soon established a pattern of waking about three or four o'clock in the morning to gain easy access.

The slowest part of the system was the branching. As I will discuss later, I was not able to utilize the branch method until quite late in the semester. While it was potentially an extremely important instructional device, its slowness definitely interfered with its use.

One final comment on EIES. I was surprised how few students explored on their own initiative the variety of non-course opportunities available on EIES, the public conferences, etc. Also how few made any attempt to talk to their fellow classmates in other than required ways. One girl did attempt on several occasions to ask the others questions like "Did you find this assignment difficult?" or "Did you have trouble finding the index?" She never received a response. I must take partial responsibility for this lack; I realize that the instructor must continually search for ways to get the students to interact. However, one of the difficulties with teaching such a course for the first time is that one becomes focused on the mechanics of the course and keeping it going. And, of course, students experience the same difficulty. CHAPTER OBJECTIVES

Both the chapter learning objectives and the quizzes were primarily designed to encourage students to master the wide range of detail contained in each text chapter. Their purpose was to ensure extensive learning, while that of the mini-lectures, assignments and discussions was to focus more intensively on specific issues.

The list of objectives was entered into the conference at the

same time that the chapter was assigned for reading and study. Students were encouraged to make printouts of them. Each set of objectives consisted of ten to twenty items that the students were expected to be able to discuss after they had mastered the chapter and minilecture material. Students were informed that their exam questions would be drawn directly from these objective lists and they were. Because the lists were so extensive, they stressed many significant areas that we did not have time to discuss on-line, and, therefore, which the students had to master on their own.

QUIZZES

Each quiz consisted of twenty objective questions: true or false, multiple choice or fill-in items. They were purposely very detailed to encourage a thorough study of the text.

Designing a method by which to give quizzes on line was a real challenge. Obviously the usual proctoring methods to prevent cheating were unavailable. After considerable thought I devised the following method which while not foolproof seemed to have worked fairly well: Quizzes were entered into the conference four or five days before they were due, often on a Saturday to be completed by midnight Tuesday or Wednesday. They were entered with instructions that as soon as the student felt ready to take the quiz, it was available by requesting a +READ. After entering the +READ command, the quiz would appear on the screen, and the student would have a maximum time in which to complete it (usually five to ten minutes) by sending the answers to me in a private message. No printouts were allowed nor collaborations (Lab assistants were encouraged not to permit the use of printers for this purpose). My control over the

procedure consisted of time reports that the EIES system provided. When +READ items were requested by the student, the system automatically sent me a message with the time that the quiz was displayed. The private message that the student sent with the answers also had a recorded time. I could easily determine how long the quiz took by comparing the two. Since the permitted time was very short, it was difficult to cheat or look up items in the text.

This obviously was not a foolproof method, but it did work suprisingly well. Only once did I detect a case of student collaboration and by pointing it out, stopped it from continuing. It is possible that other cheating occured; however the grades didn't reflect it. If they cheated, most students did a very poor job of it. So even with their defects, the quizzes did serve their main function which was to encourage the students to read their assignments and study them carefully.

After receiving the students' answers and grading them, I then had to develop a simple, reasonably quick procedure by which to communicate the grades and provide comments on the answers. I wanted to avoid using excessive time sending a private message to each student. Fortunately the EIES system allowed students to choose a pen name which only they and myself knew. By entering a conference comment using these pen names, I was able to communicate everyone's grade with anonymity.

The problem of commenting on the quizzes still remained. In a regular class the quiz can be given simultaneously to all students and can be immediately reviewed with the correct answers and, if necessary, with explanations. With the on-line class this was impossible. Students took the quiz at different times; some did not meet the deadline or, if they did, it was only at the last minute.

Consequently it took me some time to collect all the answers and grade them. Almost a week could pass between the time that the first students took the quiz and the time that all their grades were submitted. Feedback was delayed and its teaching effectiveness greatly weakened.

I soon discovered that providing written explanations of each answer demanded much more time than was practical, considering all the other work involved in keeping up with the conference. I, therefore, decided to provide explanations of only those questions which a large number of students answered incorrectly. Looking back, I question whether the effort to provide these explanations was worth the trouble. I suspect that most students looked primarily for their grades and gave the explanations only a fleeting glance; while this is often their inclination in off-line classes too, there they are a captive audience, and it is more likely that some of the discussion of answers will be absorbed.

In retrospect, I am still unhappy over the degree of control available for encouraging and insuring mastery of the wide range of material contained in each chapter. While I have the same problem in regular classes, the lack of face-to-face contact intensifies it in computer conferencing courses. MINILECTURES

The minilectures seemed to be successful; the points made in them were usually reinforced with appropriate assignments. The still unresolved question was how many and how long these should be. I quickly found that I needed to write more in some chapters than others depending on how many complex ideas there were that required special attention. It may well be that even more minilectures would have been preferable. One student did complain about the lack of more lecture discussions. She, obviously, had difficulty absorbing

the material from the text; she eventually dropped out. There was no feedback on this from other students. ASSIGNMENTS

Overall the assignments were successfully completed and served their purpose. They were designed to force the students to apply course ideas and concepts to their everyday life and personal experiences. I found that most students liked to talk about themselves and were less sensitive about exposing their private worlds in writing than they usually were orally in the regular classes. In general, they also wrote more.

There remained the question as to where the instructor's responses to assignments should be sent: to the conference where everyone could read them or to the student as a private message? I used both methods, especially the private message mode when the response drew upon very personal experiences and information. However, in general, I prefer the public conference response because it utilizes one of the unique advantages of conferencing; it allows students to see the quality of other people's work in comparison to their own. This opportunity is seldom provided in the normal classroom. Even more useful might be a public publication of grades so that students could learn what a good grade requires, but I was reluctant to go that far. My responses to assignment answers usually took the form of a private message to each student containing the grade and a personalized commentary.

Looking back, I feel that much more could be gleaned from their assignment answers. It would seem that if these were placed in the conference where everyone could read them, then they might elicit commentary from the other members and stimulate on-line discussions. Unfortunately, with this class I was never able to get this kind of activity started.

I did try one assignment specifically to create member interaction. The conference was divided into small groups of about three to four members. Each group was required to work out a response to the assignment through a series of private messages and negotiations. It was not a success. Some students didn't participate or excessively delayed their responses. In most groups one, sometimes two members, did all the work and provided the final report. This led to resentments and made assigning objective grades very difficult. DISCUSSIONS

One of the teaching goals of the on-line course was to encourage interactive discussion among students. Unfortunately I was never able to achieve this goal. Although students were frequently encouraged to respond and react to the each other's comments, they did only to a minor extent. When discussion questions were introduced, most students did contribute an opinion but real dialogue did not ensue. Even when occasionally a student directly asked the others for help or clarification, there was no response; they relied upon me as coordinator to handle such requests.

Several factors contributed to this lack of interaction. 1) Students brought to the conference their previous behavior patterns. Even in the regular classes our students are generally reluctant to dialogue and contribute. 2) Both the students and myself tended to focus our attention on that with which we were most uncomfortable, the mechanics and procedures of computer conferencing. Just getting the comments in and keeping up with the flow received priority. In the early days of the course I found that I was often distracted by these formal demands and sometimes didn't respond rapidly enough to student contributions, thus weakening the momentum. 3) We all suffered at times from overstimulation. The seemingly endless flow

of comments, assignments, lectures and instructions coming in in a rather unorganized stream, confused and distracted. The use of branching would have avoided this condition, but I was reluctant to introduce branching immediately and did so only in the last month of the course.

Branching should be introduced quite early. I did not choose to do so in this situation for two reasons. First, the students were having a hard enough time getting used to the system and mastering the simple tasks of sending private messages and conference comments; I simply didn't want to add to their discomfort. Second, I knew that the branching program was still in the process of development. It had an extraordinarily slow response time, and students were already frustrated with system delays. By the time that I did introduce it, the program had been greatly improved; yet even then many technical problems remained. Students had lots of trouble getting it to work; I had lengthy discussions with the programmer before things were finally smoothed out; one of the better students, somewhat annoyed, challenged me to explain the advantage of using it. By the end of the course, however, the branching program was working well but too late to our meet our needs. EXAMS

The two exams, a midterm and a final, were given face-to-face. The midterm results were extremely disappointing and disturbing. Of the thirteen students who took the exam, eight earned a D or an F. (On the other hand, two earned a solid A; one was a fulltime employed, adult night student and other, the high school student.) These poor results created a very serious situation. We had an obligation to the students taking this on-line course to see that they had a success chance equal to those taking a regular off-line course. I, therefore, arranged two unscheduled face-to-face review

sessions and permitted those who attended to retake the mid-term. Six used this opportunity although two of them still only earned a D and an F on the retake.

Also one other change was made. Since the exam questions were based on the chapter objectives, I decided that I should increase the emphasis on them and begin to occasionally ask some student to answer an examlike question in the conference. This, I hoped, would provide an example of what I expected on exam answers; however, looking at the final exam grades, there is no evidence that this made any major difference. CONTROL OF STUDENT PARTICIPATION

Student participation did not in general meet the requirements that had been set at the beginning of the course. I had expected that students would come on line at least three times a week and would keep up with the assignment schedule. Soon it was obvious that for many this was not happening. In order to monitor their activity level, I began to maintain a weekly summary of the number of times that each did come on line. The EIES system makes available on request a list of conference members and the comment identification number of the last comment that each had read. I made a copy of this list every morning and marked any student who had read additional comments since the previous day as having come on line. It was then apparent that many were averaging only two times a week or less, not three.

I immediately put pressure on those students with both conference and private messages. Sometimes I telephoned. By the middle of the course, however, the pattern that each student had established did not change greatly no matter how much I complained. This attitude, of course, is not unique but a typical one of some students in any course, but in this type of course without face-to-

face contact it was especially easy to be absent.

Besides a low level of conference participation, the amount of time most students spent on line was not impressive. Nevertheless, several of these students complained about the amount of time required for the course. One young man, a fairly good student, insisted that the course required more time than he could afford and much more that other classes; yet his record of time on-line did not reflect this. Several others felt that the number of assignments was too demanding. In reality I know that most students spent less time on this course than they did in almost any other class. My assessment of this contradiction is that either those students had not taken other courses that were very demanding (six of the failures were freshmen) or that their attitude reflected their frustration with a mode of communication that was often extremely slow and demanded an unusual degree of self-discipline on their part. However, it should also be noted that several students were very conscientious about participation. THE INDEX

About half way through the course the need for an index of chapter objectives and assignments became apparent. Many students never mastered the search capabilities of EIES and were frequently asking me in private messages about where to find those items which for some reason they had missed or had to review and make copies. This I provided as a +READ request and kept adding to it as additional items were assigned. By the end of the course I had mixed feelings about the index. It did meet a legitimate need for a listing of important materials, but it also encouraged some students to depend only on it exclusively and more or less ignore all other conference comments not directly relevant to a graded assignment. There already had existed a tendency by some to quickly skip over any

conference comments, whether by myself or by others, that were not directly related to them individually; the index only made it easier to do so. The demand for an index also reflected the growing trend among some students to fall behind in assignments and start turning in items very late. Without the index they had trouble locating the original assignments that they were missing. In some courses I would not have accepted these late items, but again, a concern that the students in this course have an equal opportunity to succeed encouraged leniency. This lateness problem grew as the semester moved to completion, and the demands of other courses increased. It was obvious that under pressure neglect of the on-line course was easier than neglect of a face-to-face course. PRIVATE MESSAGES

While I had no direct access to them, my impression was that there was very little intercommunication between the students themselves through the use of private messages. There was, however, considerable communication between individual students and me. Most of their queries to me concerned the operation of EIES, questions about assignments and exams, and explanations regarding nonparticipation or absences. On only two or three occassions did anyone ask for a clarification of course content material. This dearth of content related questions was not unique to this course, but is typical of many regular courses as well. How to stimulate students to think and ask questions remains a major instructional challenge.

My private messages to students mostly contained suggestions for improving assignments, clarification of EIES procedures, encouragement and praise and additional unsolicited explanations of content where I saw weakness in comprehension. Almost all of these private messages were important, but without a pattern of

interstudent communication, they tended to reinforce the traditional instructor-student relationship, not a student-student one. MY ASSESSMENT OF THE COURSE

As an educational experience, this course was not equivilent to the regular face-to-face Introductory Sociology. Several factors, many of which have been touched upon in the previous discussion, are responsible for this assessment.

1) As I originally had anticipated, considerably less content material was covered than in the regular course. Normally two or three additional chapters would have been required and discussed. I don't believe that this outcome could have been substantially improved. With inexperienced students a large amount of course time must be used for EIES training and problem solving. Further, because of the very nature of computer conferencing, the communication interaction among conference members is not simultaneous; a considerable time lag develops while everyone submits comments, and even more is required if the members are allowed to respond to each other's initial comments. As a result, the number of discussions must be limited. If not, those of one week will overlap and interfere with those of the next week. This is especially important since in this course most weeks must begin with an entirely new topic.

2) Not only was there less content, but less enrichment and elaboration of the content. The amount of lecture material was reduced and also the opportunty for detailed review. In addition, the complex, subtle signals one gets from students in face-to-face oral interaction were missing; this made it very difficult to determine what parts of the chapter students really understood and what needed further explanation.

Consequently, I don't think on-line courses are best used for introductory courses in the social sciences for, as I explained previously, these are built upon a brief sampling of a variety of topics in rapid succession and with much factual detail. On-line courses are much more adaptable to advanced courses where the aim is intensive exploration and creative indepth thinking about a single content area, i.e., sociology courses like Social Change or Complex Organizations.

3) Message and comment overload combined with inexperience in the use of of the system by both the students and myself frequently led to a feeling of confusion and discomfort. There was so much to cope with at the same time. There is no question that if branching had been easier to use and introduced very early, a much more orderly environment would have emerged. The conference would certainly have appeared more structured and controllable to everyone.

4) The conditions mentioned in point 3 also led to an overemphasis on those course elements which are directly graded and specifically required, i.e. the assignments. By the end of the course student attention focused on getting the assignments completed and in. This concern for completing the formal requirements deemphasized anything that didn't directly contribute to them, especially spontaneous discussion.

5) The way that students were recruited was not typical of the way it is usually done for the regular course. Most of the students were acquired in the final hours of registration in an attempt to ensure that this experimental course would run. Many, I think, came with no particular interest in the course and an unrealistic idea of how much work the course would entail. The idea that there were no formal classes to attend on a weekly basis may have given a false

impression. The result was an unusually high dropout rate and very disappointing mid-term grades.

6) Most of the students were freshmen and first semester sophmores. Many were very inexperienced in college and had not developed good study habits. This is not an unusual condition in the Introductory Sociology course, but it had especially serious consequences in an on-line conferencing course. On- line courses emphasize those very skills in which many of our students are most lacking, reading and writing. Reading and comprehending a textbook is very difficult for many, and the on-line course intensifies this difficulty by requiring even more reading. Further, it eliminates the very means by which many students actually do their learning, through the spoken word. For this reason alone I believe that on-line courses are most adaptable to advanced courses where students are experienced and more likely to come with better developed study skills.

7) For the same reasons mentioned in point 6, many of the students were lacking in self-discipline. This also is a quality that is developed with more experience in college. Many who lack this are eliminated in the first year or so. This is another reason that I feel that on-line techniques are less adaptable to freshman level courses. Students must be capable of managing their own time, of establishing and maintaining a routine schedule of computer useage and of coming to the lab just as they would to an off-line class.

After having taken a rather critical assessment of the course, I would like to emphasize some very positive elements. On-line courses do encourage students to write better responses to their assignments. The fact that other students will read what they have written often stimulates more effort. I also found that students seem to feel more

at ease about revealing personal experiences. The options that EIES provides of sending annonymous or penname responses encourages the more shy person to express him or herself more openly.

The fact that they must write also forces them to get practice in writing. As mentioned before many contemporary students have had little writing experience; colleges like Upsala must provide remedial training. On-line courses help to reinforce these skills.

They also allow students to see what other students produce. In most courses this opportunity is not available. Seeing other people's work may help students to develop a more realistic evaluation of their own performance.

Finally, I found that designing and coordinating this course forced me, as the instructor, to rethink my own approach to the introductory course in a disciplined manner. I was forced to rearticulate my goals and consider the means that I had been using. The result is that I have altered aspects of the regular off-line courses, especially demanding more written assignments and taking more care to clearly convey the course objectives.

While I have taken a strong stand against completely converting introductory social science courses to on-line courses, I am strongly in favor of using on-line assignments and discussions as supplements in such courses. They have the ability to stimulate creative in-depth exploration of major themes, and they introduce novelty and excitement to the course. WHAT SHOULD BE DONE DIFFERENTLY IF THIS ON-LINE COURSE WERE TO BE REPEATED

1) Much more publicity should be given before registration. The advantages of the course should be sold to both the students and the advising faculty. Hopefully this would encourage the enrollment of really interested students. The publicity, however, should also be

realistic, clearly emphasizing the discipline and work that will be demanded. Participation should be limited to students who have taken the basic introduction to computers. Of course, the most desireable requirement, but unrealistic at the present time, would be that students must have their own terminal; this would encourage more regular and spontaneous participation.

2) A more efficient training program should be developed. Rather than large group training, a number of smaller group training sessions should be arranged. Students should also be required to immediately study sections of the EIES manual and be tested on comprehension. The quicker that students master the basic techniques, the more quickly the course can proceed.

3) Now that the minilectures and assignments have been established, more time should be devoted to developing techniques that encourage student interaction.

4) Instructors should be given many opportunities for using on-line assignments in regular courses before organizing totally on-line ones. The more experience they have the better the outcome is likely to be.

5) Branching should be introduced as early in the course as possible. It is the only way to maintain a sense of order and encourage creative interaction.

6) More opportunities should be given students to practice writing answers to questions based on the course objectives so that they would know what was expected of them on examinations.

7) Whatever is necessary to provide labs with adequate working equipment and knowledgeable lab assistants should be carefully done. This is very important. Students should not be distracted by inadequate and faulty equipment nor by technical problems.

REPORT ON A "VIRTUAL CLASSROOM" EXPERIMENT

Course:COMMON CURRICULUM 140Y COMPUTER-ASSISTED STATISTICS

Given at Upsala College during the Fall Semester,1986

Instructor: C.Lincoln Brown,Ph.D.

I. Course Description.

The course CC140Y Computer-Assisted Statistics is a new course, adopted by the Upsala College faculty as part of its revised general requirements for students begining in the Fall semester of 1986. It is actually a "half-course" (the equivalent of a 2-credit course elsewhere) which is given over a 7 1/2 week period constituting the second half of an ordinary 15 week semester. It follows a companion course CC130Y Introduction to Computing which serves as a pre-requisite; it is therefore possible to assume that students are familiar enough with computers in general and those at the College in particular to be given assignments involving computer usage. The catalog description of the course reads as follows: "An introduction to the concepts and methods of statistics, making use of computer software, including either SPSS or SAS. Topcs include graphical description of data; measures of central tendency and variability;probability; binomial and normal distribtuions; correlation; regression; chi-square distribution."

II. Course Content, Fall 1986

As given (other than experimentally), for the first time during the fall of 1986, in matched online and face-to-face sections, the material covered varied somewhat from the course description. For one thing,after an upgrade of the College's Prime 550-II Computer operating system neither SPSSX or SAS worked properly, and with the

planned micro version of these statistical packages not yet ordered, any use of this software was impossible. The topics actually covered were as follows:

Week	Topics
1	Introduction;random number tables; computer simulations; frequency distributions; bar charts;histograms.
2	Frequency polygons;ogives;pie charts; mean, median,mode;coding surveys.
3	Standard deviation;percentiles;z-scores.
4	Review; using SPSSX; mid-term exam.
5	Correlation;regression; probability.
6	Binomial and normal distributions; normal approximation to the binomial.
7	Hypothesis tests.
8	Final examination.

III. The "Online" Section.

After two days of orientation on the use of the EIES network, students were entirely online for the course,except that both the mid-term and final exams were given in a classroom. Since students would not be coming to class, all materials - data sets, text supplements, etc. - had to be prepared and distributed during the first two days of orientation. These materials included seven sample data sets, ranging from a simple one containing 10 records of student names and grades on three tests,to the results of 500 (computer-simulated) rolls of a pair of dice, to a description of an SPSSX systems file containing information about employees of a bank involved in charges of discrimination. Students also got some sample graphs which could not conveniently have been sent by computer.

Material was usually presented online much as it was in

class, via an essentially lecture format. An attempt was made to cover the basic points and illustrate with worked-through examples. Students were given related reading assignments in the text, and given the option of reading the text either before or after reading the "electure". Students in the online section were usually given athe same problems to do as were those in the face to face section.

Where there turned out to be the biggest difference between the two sections was in the type and quantity of material "collected" to be graded. While the regular section was given one problem to turn in at the next class meeting almost every time, it proved difficult to do anything comparable with the online section for a number of reasons.

In a few cases, such as in a problem requiring students to draw a histogram or a frequency polygon, submission online was not a reasonable possibility. For the most part, however, the problem was more that submitting a solution online would require a great deal more time than simply showing the work on paper - in practice, the student would have to first work out a solution on paper and then additionally type it in to the conference. It was possible to have students submit their \answers\ to problems - for example, to report the mean and standard deviation for a data set - and this was done. However, it generally wasn't satisfactory, for when answers were not correct it wasn't possible to pinpoint the errors.

A second difficulty with the online format was the unavoidable time delay between posing of a problem, students' responses, and the instructor's comments on the responses. In a course such as Statistics, where material constantly builds on

previous topics and on presumably mastered skills, each class has to presuppose that there is at least a basic understanding of ideas covered in the previous class. In an online situation, if there is to be an attempt to keep the class together, the period from problem statement thru student solution to instructor response always took at least a week, an unacceptably long time.

Certain types of problems worked better than others. In the opening conference comment, students were asked to "guess" the probability that the Mets would rally from a 0-2 game deficit and beat the RedSox in the 1986 World Series. Such a question is easily answered (though not necessary reasonably!) and the answers are easily commented on. Moreover, discussion of this problem can and did constructively continue even as the course work proper was being covered. On the other hand , when students were asked to present online a frequency distribution for a set of 50 starting salaries, and didn't yet understand that the salaries should be grouped in some manner, they tediously entered a useless 49 line table and probably turned off at least a bit to the online concept. When attempts were made to shorten the necessary response by just requesting answers, there was the problem of correction and commentary mentioned previously.

The problems addressed in previous paragraphs seem to be a function of the particular course and the particular students, and seem not to reflect anything inherently wrong with the online approach. The sequential nature of the material was cited above; its objective nature seems also relevant. (There \is\ a correct answer to a problem which must be arrived at - in another kind of course where right and wrong are more subjective, discussion could continue indefinitely.) Even these problems inherent in the nature

of the material could be surmounted with the right students and facilities. It is well understood that for this instructional method to work, students must be able to take responsibility for getting assignments done in a timely manner. With students capable of taking such responsibility, and with better access to a computer terminal - one in the home or dormitory room seems almost necessary - the cycle for a problem could be cut to an acceptable 3 or 4 days.

There are capabilities in the EIES system for alleviating some of the difficulties encountered, but some of these options were still in development stage and the introduction of others would have required still more time (in addition to the two initial days of training) away from what is only a 7 week course, with probably 9 weeks of material, to begin with! The +BRANCH facility in particular fits all of the above categories. It is a very useful way of organizing a course so that the essential material doesn't get lost among the myriad unessential comments. However, in two or three hours of initial introduction, it seemed too much for students to grasp; with no additional face-to-face meetings, it would have been difficult to present. In a full 15 week course, the time necessary would certainly be worth spending; with the rushed nature of the Statistics course, and with some problems (not least of which was its slow speed) not yet worked out at the time the course was given, it was decided to do without +branch.

IV. Outcomes

Certain aspects of the two sections are not directly comparable. As mentioned previously, the assignments made to be submitted for credit differed considerably between the two

sections. In fact, in the online section there had to be some subjective judgement as to the amount of participation in the conference, so that grades for assignments and class participation (1/3 of the total course grade) were made there on a letter basis (A,A-,etc.) rather than on a numerical (out of a possible 100 points) basis as they were for the face-to-face section. Moreover, due to a system crash during the last week of the course in which conference materials dealing with the last major topic (hypothesis tests) were lost, 20% of the material on the final exams differed for the two sections.

However, the entire mid-term exam and the remaining 80% of the final exam are directly comparable, and it seems reasonable also to compare final course grades (done below via an assignment of 4 for A, 3 for B,etc.). The means and standard deviation for each are given below.

	FACE-TO-FACE		ONLINE	
ITEM	MEAN	STD. DEV.	MEAN	STD. DEV.
Midterm Exam(Max 100)	71.00	16.91	69.75	17.90
Final Exam(Max 80)	47.28	19.95	42.33	19.19
Course Grade (Max 4)	1.77	1.31	1.75	1.22

In each case, there is clearly no significant difference between the outcomes for the two sections. Even in the case of the final exam grades, ere the difference of the means is greatest, a t-test gives a t value of only 0.68 with a significance probability of 0.50.

For a course such as Statistics, with some of the obvious difficulties inherent in offering it online, getting results equivalent to those of a traditional section in a first attempt seems very encouraging for the online concept. The course is scheduled to be repeated online during the Spring semester to see if there is any difference in a second offering.

REPORT ON A SECOND ONLINE TRIAL OF CC140Y:

COMPUTER-ASSISTED STATISTICS, UPSALA COLLEGE, SPRING 1987

Instructor : C. Lincoln Brown, Ph.D.

CC140Y Computer-Assisted Statistics is a course new at Upsala in the 1986-87 academic year. It is a "core" course required of all students, usually to be taken during the Freshman year and following another required course, "Introduction to Computing." Actually each of these courses is a "half-course", lasting 7 1/2 weeks. It may be thought of as covering the material usually found in the first half of a standard non-calculus-based statistics course, except that students use the computer as a tool for obtaining a better understanding of the subject. Since the computer was the means of delivery of this particular section, little additional computer use was made this time. A more complete description of the course and its content was given in the report of the Fall semester activity.

This time there was no matching face-to-face section, the purpose being rather to see what difference there might be in a second online offering as opposed to the original version. There was no attempt to change the course content or the basic method of delivery, but instead minor modifications in procedure were made. The only changes in content involved a decision to omit the brief introductory lecture material and the unplanned omission of the last scheduled topic for lack of time.

One new feature used, generally successfully, this time around was the capability for giving online quizzes. This proved to be a useful way to force students to keep up better with the pace of the

course. If an easy way of allowing for multiple questions in the +QUIZ procedure can be developed, it should be still more useful.

Another new feature which seemed to work was an assignment for students to complete a brief online survey as their first contribution to the class conference. This was something both easy for the novice user to do and useful information when collected into a class data set for processing during the course.

The +branch facility was again not used because it was felt that no more time could be taken for introducing students to the course delivery system at the expense of course content in a course meeting only for 7 1/2 weeks, after most of the first week had been lost to an introduction to EIES. Were the course a full 15 weeks' duration, +branch would certainly have been included for its organizational usefulness. Instead, a conference comment was set up to serve as an index to the conference. As lectures and assignments were added, the index was modified to note their locations. This served as an acceptable alternative to +branch.

The results of the course were very dissapointing. Of 12 students registered, five failed the course; three of these dropped out before the final exam, and the other two failed by virtue of having done essentially none of the course assignments. There was only one "A" and one "B".

Why such poor results? There are a number of partial explanations outside of the means of delivery of the course. A course in Statistics, required of rather than elected by students, would predictably be found to be difficult by most students; furthermore, the fact that these students delayed taking the course until the Spring semester means in some cases that they had to first fulfill a basic skills math requirement and thus were weaker math

students than those who took the course in the fall.

However, both the instructor and, I believe, the "online" method of presentation, must share the responsibility for the results. As the instructor I was unable to motivate/force the timely participation necessary for success in such a course. Despite due dates, assignments straggled in; I then compounded the problem by waiting until all were in before grading them, and by then so much time had elapsed that everyone had forgotten what the assignment had dealt with.

There are better ways to handle this time-lag problem but it is a problem to be reckoned with. A course of such a sequential nature as statistics requires a degree of understanding of each topic before the next can be understood; this seems to necessitate the same kind of time frame for the reading of materials and the doing of assignments as in a traditional class - for example, lecture on Monday with problems due at the next class on Wednesday. This is virtually impossible to expect in an online situation.

One object of the virtual classroom experiment was to find in which kinds of classes and for which students online learning is effective. It does not surprise me that a required course in statistics for "non-majors" taken by generally poorly prepared (40% of the students must take remedial basic- skills mathematics upon entering the college) and poorly motivated students would be one for which the method is least effective.

Perhaps if any of a number of parameters were changed, the course would be more successful in an online format. If the students were either better prepared or perhaps older or for whatever reason had the necessary self- discipline it might work. However, for less than ideal students this course will always have a fundamental

disadvantage in an online format - the possibility of stopping an instructor in the middle of a problem solution and questioning a step at that moment before he or she proceeds, seemingly such an important part of the mathematics learning process, will not be possible.

This conclusion is perhaps unduly negative. It should be remembered that in the Fall experiment there was no significant difference in results between paired online and face-to-face sections and student reaction was generally positive. A fairer summary might be to say that in order for an online approach to statistics to work well, prospective students should be carefully screened to make sure that they have the motivation and ability to be able to participate effectively, and that a method must be found to provide more timely feedback to students.

MY STORY: VIRTUAL LAB FOR OS 471 MANAGEMENT PRACTICE

L. ENRICO HSU

Description of the Topics Covered in the Course

OS 471 is an overview of management practice for students who are NOT majoring in business or business-related fields. A 3-credit course has to cover all practical aspects of management. The selected textbook (David R. Hampton Management, 3rd edition, McGraw-Hill, Inc.) closely reflects the content of the course. The syllabus is as follows:

Session	Topics	Reading Assignment
1	Orientation and introduction	
2	EIES training	
3	Organization Design and Organization Structure	Ch. 7 & 8
4	Coordination	Ch. 9
5	Groups in action	Ch. 10
6	Motivation	Ch. 11
7	Leadership	Ch. 12
8	Communication	Ch. 13
9	Controls	Ch. 16
10-11	Production and operations management	Ch. 17
12	Review of materials covered	
13	Mid-term exam	
14-16	Management information system	
17	Mission and objectives	Ch. 4
18-19	Strategy and policy	Ch. 5
20-21	Decision making	Ch. 6
22	Conflict, change and development	Ch. 14
23	Human resources management	Ch. 15
24	Managers and managing	Ch. 1
25	Perspectives on management	Ch. 2
26-27	Organizations, environment & social responsibility	Ch. 3
28	General review of topics covered	
29	Final exam	

All the course materials were covered in face-to-face sessions. In parallel with the course topics, a series of practical activities were planned for the students to perform. Through students' own efforts, a simulated company was organized and operated. The following is the list of planned activities:

Item	Description
1	Ad hoc committee for organization
2	Resume writing
3	Interview and appointment of functional managers
4	Interviews and selection of departmental staff
5	Departmental organization meeting
6	Position description and performance standards
7	Departmental planning meeting
8	New product planning meeting
9	Production planning meeting
10	Product coordination team formation
11	Production crisis meeting
12	Cost improvement program
13	Major crisis management
14	MIS proposal
15	MIS design review
16	Record management meeting
17	Performance review
18	Strategic planning for the next fiscal period

Obviously, class sessions did not contain enough hours to conduct these meetings and discussions. Neither was it possible to schedule additional hours for the purpose. The bulk of communication was, therefore, conducted through EIES. A conference was set up for the main body of discussions, assignments, reports, minutes of meeting, proposals, etc. Messaging facility is used extensively for behind-the-scene deliberations and negotiations. Membership directory is maintained not only to display regular identification information, but also to show the positional title within the simulated company.

Materials and Activities Provided by the Instructor

The materials distributed through the on-line conference were the following:

*Assignments: reading assignments, writing assignments (resume, etc); (see above)

*Instructions or Standard Operating Procedure: Either for using EIES or for performing company functions;

*Analysis: Budget analysis, break-even point calculation, MIS needs survey, MIS functional specifications, form design, etc.;

*Announcements: Public notices, meeting announcements, schedule changes, exam coverages, etc.;

*Pep talks: For the tasks well done.

It is to be emphasized here that no lecture was delivered on-line. That is the major point of departure from the general practice of "virtual classroom". The rationale behind this practice was that the textbook chosen was easy to read and did not require repetitive entry of course materials. On the contrary, the communications as enumerated above were creative in nature and specific for the class in question. Furthermore, each item involved some work to be done. Thus "virtual lab" was a more descriptive connotation.

What Worked Well?

The EIES system made it possible to organize various groups (company, departments, sections and study groups) and the group dynamics made the class an extremely cohesive learning group. Through constant guidance in an informal manner, I was able to get psychologically close to the students.

In contrast with the other section of OS-471 that I taught without the benefit of EIES system, "virtual lab" has enabled the

students to communicate much more freely and with "rich" content (expression of satisfaction, pleasure and desire to continue their involvement). Statistics might shed some light to my assertion: during the semester, the class entered 403 comment items (9865 lines) an equivalent of a book of 150 pages. Moreover, four comments of mine elicited dozens and dozens of responses, using the "BRANCH" facility which is an enhancement to EIES specifically designed for the "virtual classroom" project. In addition, an unknown number of lines of messages were exchanged among the members for behind the scene consultations and deliberations.

The fact that the president of the simulated company was an old hand in EIES (Ed Kietlinski began using EIES in 1984; he was also the president of Microcomputer User Group) must have helped the operation of the simulated company on EIES.

The availability and operation of "Virtual Classroom Project Laboratory" (Weston Hall 306) with a number of microcomputers and printers directly connected to EIES system facilitated the operation of our "Virtual Lab" tremendously. In fact, Heidi Harting, a system programmer who makes her office inside the laboratory, has told me many times that my students frequent the laboratory most regularly.

Comments on the Grades

While the lab work has a great impact on the acquisition of practical skills, the accomplishment was NOT reflected in the grades given to the two sections of students because 50% of the grade was based on the written exams taken from book materials that were covered in face-to-face sessions for both sections. The other 50% of the grade represented "efforts" in performing tasks in the simulated company. Therefore, I did not expect any differences in grades between two classes. I did not want to penalize the section without

"virtual lab" for producing less written materials since the volume of output was constrained by the clumsiness of telephone communications among the students, manual typing, Xeroxing and distribution of various documents.

Comments on Group Learning

The very nature of "virtual lab" and its intrinsic objective is group learning. The most important accomplishment of group learning was the acquired skills in group communications and group decisin making. I regard the frequency of revisions of conference comments as one indicator of the positive results of learning. I assume that the assignments submitted to the conference were modified to reflect some improvement through the examples of other people's work. I counted 31 such revisions which is a significant number.

Room for Improvement

Any such innovative experiment has room for improvement. In fact, some students made meaningful suggestions for improvement which are immediately implementable:

*Instead of one, two simulated companies could operate in competition with each other;

*Two competing companies should run their own conferences;

*Instructor should interfere when students waste too much time and efforts on some topics irrelevant to management practice, such as detailed design of product;

*Instructor should also simulate the environment and let the two companies react to environmental changes.

Conclusions

At this point, I prefer to leave this report open-ended. I only

want to reassert my conviction that the concept of "virtual lab" for management education deserves serious attention. The concerted efforts of pragmatically minded educators and system designers are needed to score a real success in this endeavour.

SECOND TIME AROUND OF VIRTUAL LAB FOR OS 471 MANAGEMENT PRACTICE

Enrico Hsu

1. Description of the topics covered in the course

As previously reported, OS 471 is an overview of management practice for students who are NOT majoring in business or business-related fields. The topics and syllabus remain essentially the same as the first semester. However, the conduct of the course (I am speaking of two sections I taught) has undergone a significant change, both in the conduct of face-to-face meetings and in the virtual lab portion of the course.

2. Changes in the conduct of face-to-face meetings

Students were divided into 6 study groups consisting of 5 to 6 students each. Groups were assigned a number of chapters of the text book, on a rotation basis, and were required to prepare the chapter outline to be posted in the EIES conference prior to verbal presentation in the class. Further coordination within the group as to who does what during the presentation is entirely up to the group. Groups have informal leaders responsible for internal coordination. As expected, the group which presents the material mastered the materials thoroughly. The rest of class is advised to read the materials in advance so that they can participate in discussion. Success in this area is limited. Without a strong incentive (10% of the final grade), students habitually defer reading of materials assigned to other groups until much later. Presentations were evaluated by the students in the audience. Instructor makes comments

on the students' presentation, adds supplemental remarks on the course materials, elicits discussions relative to the subjects just presented. The basic ideas behind these changes were: to encourage students to read the text at least partially during the semester rather than at the very end, to make class presentation more varied, to encourage group learning, and to afford students the experience of running informal groups for a specific type of coordination.

3. Changes in simulated business operations

Instead of one organization (as in Fall 1986), two competing organizations were simulated. Approximately 40% of class time was devoted to running company or department meetings for the purpose of laying down some ground rules of communication, or making task assignments, knowing that the communication will continue through electronic media.

4. Changes in the use of EIES

Instead of one conference (Fall 1986), three conferences were set up:

. General conference for the whole class: A general conference is set up for all the class members with the instructor as the moderator. The instructor uses this conference to make announcements of general nature, e.g. course syllabus, class schedules, lab activity schedule, exam scope and schedule, grading policy, reading assignments, etc., and to conduct discussions/debates on many chosen subjects. Most recent examples are: formal vs. informal organization, your preferred leadership styles. Students use this conference to enter the outlines of the course materials they are assigned to present, and to communicate with any or all members of the class on subjects of public interest.

.Two other conferences were set up for the two simulated companies with the respective presidents as the moderators. Students belonging to one conference have no access to the other conference. Students use these private conferences to conduct their simulated company business. Assignments or comments of a general nature are: resume and job application, negotiations for specific job assignment, job description of the acquired position, departmental budget preparation, functional specifications of an information system. Other comments

pertain to their specific job assignments, such as sales forecasting, product design, product specification, product costing, marketing research, marketing plan, etc. When the companies are operated smoothly, the instructor introduces some environmental disturbances, such as market change, new government regulations, foreign competition, etc. Then these two companies will learn to cope with the environmental disturbance and conduct business communications (meetings, conversations, memos, letters, announcements, etc.) in the conferences. Aside from their official capacities, colleagues in these simulated companies also develop informal relationships. In summary, these conferences are the forum to practice their interpersonal roles within different types of organizations (business organization and study groups).

5. Student Reaction to the Changes

Students' reactions to the newer way of conducting the course was extremely favorable. Below are some excerpts from their comments. (References are made to the actual comment No. of the general Conference 1732; students were told that these conference comments might be quoted in a report). They generally express enjoyment, approval, and intense interest in the online laboratory activities, though with some exceptions.

> Eric Jung: "Well, I just wanted to say that I enjoy it. I don't think the virtual classroom is the way of the future, but it is an experience worth having." (C1732CC69, 2/16/87)
>
> Ron DeBlock: "Of course we are having fun!" (C1732CC71, 2/17/87)
>
> Steve Mantone: "This is great. I enjoy this system. To fully appreciate this system you must have a hook-up from home. Sit back, put the radio on, have a beer and attend class. I'm sure glad this is the '80's." (C1732CC91, 2/23/87)

Paul Yurga: "This class is really cool and so far everything is going well as far as I am concerned."

Tana Sabatino: "...since we are using EIES for virtual lab. This is definitely related to progress.: (C1732CC240, 4/2/87)

Paul Yurga: "In this course we have really stopped beating the material from the books into our heads and started applying the knowledge that we have already obtained. Everything we learn now is put into effect almost immediately, not like those silly math formulas that just reside in the back of our memory banks." (C1732CC242, 4/2/87).

Evan Peterson: "We are learning about management in a practical way by doing. And in our class we are learning management as our companies grow."

Mark Daniels: "Tyron Edwards says, 'The great end of education is to discipline rather than to furnish the mind; to train it to use its powers, rather than fill it with the accumulation of others.' This is what I believe you have been saying to us all semester." (C1732CC249, 4/4/87)

Eric Jung: " Dr. Enrico has particularly stressed one point this semester: There are no absolute answers to any questions of management. That is why we have the lab. In it, we can practice the principles involved in effective management... Not to memorize them, but to familiarize ourselves with them so that we might have

some prior experience when we need to call on this knowledge in our futures... Another famous quote from Dr. Hsu: 'We are here to have fun!'" (C1732CC294, 4/6/87)

Grace Grisafi: "Of course our class is not typical! I've told quite a few people about our 'virtual experiment'; I detected a spark of envy in the eyes of those people...exciting and "an ongoing, happening" class situation." (C1732CC357, 4/16/87).

Robert Vera: "I think that our class is very interesting and innovative, it is the first virtual class that I have taken and I have enjoyed using the EIES system very much. It has made the course fun and easy, and I would recommend other people who are thinking of taking OS 471 to get involved in your EIES experiment. The EIES system has helped me develop better communication skills, not to mention first hand experience in management problems, through our company. I believe that you should continue using the virtual class because it's indeed a unique experience." (C1732CC360, 4/16/87)

Steven Blume: "The EIES system has made this a very exciting class...I enjoy working with the computer and feel I have gained a valuable tool." (C1732CC361, 4/16/87)

Bill Smykowski: "I've never had a teacher that took such an interest in his students as you do and I'm very

happy I was able to be a part of your class."
Bill Smykowski: "The nicest thing about this class is that there is an emphasis on learning and not so much on cramming in a bunch of facts you're going to forget anyway. Thank you, Prof. Hsu for running your class differently than the normal boring class I expected." (C1732CC387, 4/26/87)

Tana Sabatino: "This class is a requirement and I can see why. I hope to be in a management position someday; not at the bottom. Now I understand the concepts and "skills" involved in being a good manager. By using EIES and setting up fictitious businesses, I put what we learned into practice. Now it's not just facts but skills...Thanks Enrico for helping us learn what is important and not just a list of concepts that we were never given the opportunity to practice. This course would not have been the same without EIES. It would have been boring and I would have dreaded going to class. Instead, especially with the part of the class on EIES, I looked forward to doing the work. I spent most of my breaks in the virtual lab classroom working on the system.: (C1732 CC394, 4/28/87)

Jorge Fernandez: "Enrico, I can honestly say that I have learned much in your class through the use of the EIES system, I have worked on problems facing our company, communicated to people in our company through the use of EIES,..." (C1732 CC396, 4/28/87)

Eric Jung: "I agree with you in respect to EIES and

this course. It definitely made a major difference. It's an experience everyone should have." (C1732 CC399, 4/28/87)

Sharon Smith: "I agree with most of my fellow classmates about this system EIES. It has made the class more interesting." (C1732CC420, 4/29/87).

Lance Lynn: "Throughout the semester I have noted that all the comments concerning the EIES system have been positive...I have learned to appreciate EIES with the help of my classmates who have made it very interesting....The class has been rewarding because of EIES, which has allowed everyone to express their ideas and opinions openly." (C1732 CC409, 4/30/87)

6. Motivation for Students to Do More Work

It is easy to conclude that students have spent considerably more time on this particular section of OS471 with Virtual Lab than the traditional sections, simply by counting the number of lines of comments students entered in the conferences. What motivated students to do so? I believe that the motivation is two-fold: genuine interest as expressed in the previous section, and a heavy percentage of the course grade assigned to the EIES work. In the beginning of the semester, it was announced that 50% of the grade would be assigned to the EIES related work. When I discovered that exams, quizzes and projects in other courses caused a decrease of activity in EIES work, I aannounced to the class that another 15% of the final grade was being transferred from the final exam to EIES work. Sure enough, EIES work became active again throughout the rest

of semester. This is consistent with the general belief that "grade" is a prime motivator for most practically minded students.

7. Debate and Controversies Stimulate Communication

It was observed that debate and controversies will hold students' attention and stimulate them to make comments. Debate on "formal vs. informal organization" was very popular with students, who not only express their opinions, but also cite their personal examples. Arguments about the usefulness of "sales persons" were pretty hot, because those students who had sales jobs couldn't stand insulting comments on sales persons.

8. How Would I Do It Differently in the Future?

The main objective of the experiment is to identify effective ways of training future managers in acquiring management skills. To achieve this end, attention is directed to making the learning more interesting (for example, two colleges running competing business organizations; incorporation of management games) and effortless; and to adopting a better system as a learning tool. A better system is defined as a system closer to business reality, by simulating the business roles in a realistic way. When roles of business executives are played out, the moves, plays, communications and behavior in general are monitored through "virtual lab." Comments and guidance by experienced instructors will help future managers to distinguish essentials from trivia, and to evaluate consequences of alternative moves. The late Norman R. in the Preface of his book "The Role-Play Technique", states: "As with any skill, book learning and demonstrations are needed, but they never will replace practice. The best kind of practice is performing under competent supervision. The

greatest need in all training programs that involve the ability to relate to other people is the opportunity to practice without being hurt or without hurting anyone else."

ANTHROPOLOGY WITH "EIES":
AN EXPERIMENT WITH USING ON-LINE UNITS

Kendy MacColl Rudy. PhD

Upsala College

For the past several years Upsala College has been one of the colleges working with the EIES network and experimenting with various forms of on-line teaching. In the fall semester of 1986 three unit assignments within the junior-level course Anthropology 350 Indians of North America were presented to the class using the EIES network.

I have used EIES both personally and professionally for the past six years. In addition, I have used computer-assisted instruction software and computer simulations of social change in other classes from time to time. This was the first time I have served as moderator of a conference, and the first time I had a chance to incorporate the class assignments into networking.

All in all, the experience was positive. At times it was a rocky ride; unanticipated difficulties arose in training and developing appropriate assignments, students reacted differently to the assignments, and the class ultimately divided on using the computer. I am teaching the same course this semester without EIES assignments; I find that something has been lost in communication with and between students. Given a choice, I'd keep the EIES assignments permanently.

TRAINING STUDENTS [AND TEACHER]

Seventeen students enrolled in the Indians course; since this is classed as a Writing Intensive Course, the cap is set at 20. Students were informed in the initial class meeting of the nature of the EIES assignments, which were also indicated prominently on the syllabus for the course. A class meeting to train students to use EIES was scheduled for the second week of class. Each student was given an account and a folder containing basic instructions about EIES. Bob Meinke has written a simple, one-page instruction sheet for the first training session; with suitable modifications [such as identifying me as the instructor and giving the correct conference number] I used Bob 's format as a training guide.

Most of the students in the course had not worked on a computer before; one was co-registered in Roxanne Hiltz's course that was also partially on line. One student presented an unusual problem; he is blind.

Since significant parts of the course were scheduled to be on line we had to figure out a way that a blind student could get the information and contribute to the class. I have worked with the student before. In usual classes he is assigned a student reader who records class assignments, and he records the class sessions. The student has only been blind for five years, and has not learned touch typing or Braille typing. Working with the student, we determined to try the pattern of student reader in the EIES assignments, with the student reading out conference comments and typing in responses. This part of the experiment was only marginally successful.

The training session was scheduled during a regular class

period. We met in the usual classroom and went as a group to the Microcomputer Laboratory. Somehow, on the way, three students decided to evaporate [more on these later]. By the time the students got to the Lab, accounts were ready for them and "codes" had been established in the system for them. I had already written a "welcome" message into the conference so that when a student learned to enter the conference there was a message waiting. Two NJIT project assistants and Roxanne Hiltz introduced the students to the system, starting with the directory. The assignments for the introduction to the system were: to establish directory information for yourself; to send a message to someone else in the class; to send a message to me; and to enter the conference. Students were given one week to complete the assignment.

Students were asked to work in pairs, one at the keyboard and one with the instruction sheet. Student reaction was mixed. Some students plodded through the instructions, did a minimum job on the communications, and left. Several students got stuck and had a mental block about touching the keyboard and had to be led through the processes step by step. Two students whizzed through the instruction and began to send messages to anyone they could find; one of them immediately found the public conference list and is hooked for life. One student became so upset that he could not continue to try to work with the system and was cajoled into making a private appointment with me for personal instruction. (He later became a system addict.) Unfortunately, this was the student assigned to help the blind student. The initial result was that the blind student became convinced that the system was unworkable and he wanted nothing more to do with it. As he became more worried and upset, his guide dog became concerned. As the dog reacted, so did the students on the

adjacent terminals. Too many people came to help and explain which further exacerbated the situation. Ultimately I called a halt to the training of this particular pair and determined to work with each individually.

The initial training session helped about 11 of the 17 students. Later individual meetings were necessary to work with the last 6, either because they skipped the training session or because they needed personal attention and coaching in order to get over their gut reaction to using the system. From talking to the other instructors I don't think this is an ususual percentage; time needs to be budgeted at the beginning to deal with fear and confusion.

THE EIES ASSIGNMENTS

1. Bibliography, communication, and facts: the arctic and subarctic

The first formal assignment over the network was scheduled to begin the week of September 17 and to be completed the week of October 1. The first unit of the Indians course is a brief survey of white- Indian contact, a discussion of the archaeological evidence for the entrance of Homo sapiens into the New World, and case studies in cultures of the arctic, subarctic and northwest coast. Throughout the unit the policies of Canada and the United States towards native peoples - Eskimo, Indian, Aleut and Metis - are presented. The class assignment was to create a bibliography about the modern situation of native peoples of the arctic and subarctic.

(1) Each student chose a geographic area or specific people; they then went to the library and located as current an article as possible about "their" people. Initially, all they had to do was list the reference.

The second task was to help other students when, in the course of looking for "your" article, an article appropriate for another student was found. Students were asked to send messages to each other under these circumstances. Three such messages were sent.

The third task was to explain the situation reflected in the article to the class, in no more than two paragraphs. I was looking for informal writing styles, with each student somewhat knowledgeable about "thier" problem. What I got was a foretaste of things to come. Three students, whom I shall call Rapid Rachel, Responsible Rene, and Dutiful Doris entered their material and asked each other questions. Constant Complaint Charles, Enthusiastic Edgar and Modify Morris [who is never satisfied with his own answers and modifies them over and over and over] followed. Then there was a gap; I reminded the class that the assignment was part of their grade, and got two more answers and the taped responses from the blind student. Then, suddenly, a student who had not done the first part of the assignment [listing an article] presented a summary of an article already identified in the conference; his summary discussion of the situation was sufficiently different from the first presentation that it seemed to be his own work. Several students did not enter their responses by the date specified and received a "0".

After the deadline for EIES comments we held an in-class debate on the nature of today's problems in the arctic and subarctic, an assignment I have used before. This class was much better informed than previous classes, and was more comfortable challenging each

other's data. I kept a tally of who was active in the debate. Those who had done the EIES assignment talked; those who had not sat quietly. The one exception was a student who works full-time as a night nurse and attends school full time in the day; she was obviously informed, but told me privately that the only time she could get to the microcomputer lab to enter her comments was identical to the only time she could sleep and she was just too tired to come to the college just for computer access. I arranged for her to have access to a dumb terminal in a departmental office (later when the Upsala library EIES access was established she used those terminals) and she became one of the more reliable participants.

2. Cooperative learning; study questions on line

The second EIES assignment was related to preparing to take the second unit test. In each class I teach, one week before the test I distribute a set of questions about the material covered in the readings, lectures, class discussions and films. These questions reflect the major points from the unit and form the basis for the unit exams. Usually there are between 25 and 40 questions for a unit, ranging from definitions to know to asking students to draw a conclusion from some material and defend it. The study questions are harder than the test, because the test is limited to an hour or so and consists of a subset of the questions. In many classes students form study groups, divide up the questions, and study together. In this second assignment I wanted to see if the study group concept could be used on-line. Instead of printing out the study questions

and distributing them to the class one week before the test, I entered the questions as messages in the conference at the beginning of the unit; each student got four questions.(2) [I did give a full set of questions to the blind student]. In both the conference comment and in class I asked the students to prepare responses to their four questions as we came to the appropriate material in the unit, and to put the answers in the conference. Other students could then [in theory] comment back. I checked into the conference regularly during the unit, and noted that very few answers were entered until the exam date became imminent.

Since so few students had taken the time to enter their conference questions by one week before the test date I announced in class that those whose questions were not answered by 3:30 pm the day before the test would be counted as not having done the assignment. There was a burst of activity. I had been concerned, however, because during this second unit of the class three students completely stopped attending, didn't sign on to EIES, and did not respond to personal letters sent to their boxes. (3) Since sections of the study sheet had been assigned to them, it was clear that some parts of the course should not, in fairness, be on the test.

The night before the test, at 9:30, I received an angry group phone call from Rapid Rachel, Dutiful Doris , Constant Complaint Charles and Modify Morris. They were livid. A student "Rip-off Richard", [the one who had piggy-backed on the first assignment], had not put any answers into the conference. Just before the microlab closed, he and two other non-responders from the class came to the microlab and printed out copies of everyone else's answers. When challenged, he said he didn't have time to study his questions and only wanted to prepare for the exam. Rachel, Doris. Charles and

Morris felt cheated and used; they demanded retribution, or at any rate, the removal of any questions assigned to Richard and his friends from the test because they had relied on a fellow student to prepare and had been let down, and now had to do "other peoples questions overnight". (I did modify the exam to the extent of giving people a choice of question to answer). When I got to the class the next day the entire seating arrangement had been changed. No one was sitting anywhere near Richard and his two friends. There was a general growling in their direction before the test. In fact, the seating arrangements never reverted to the original pattern after this.

From a teacher's perspective there had been an unexpected consequence of the assignment. In work and in "real life", when a group works together and someone doesn't do their assignment, the group report suffers and the group as a whole is criticized. In most academic assignments, which are based on individual study and preparation, when members of a class do not prepare the only one irritated is the instructor. For the first time, the students in the Indians course saw the cost to a group; they didn't like it. One of the students commented to me that since we were studying social control among small scale societies and had determined that ostracism is one way of dealing with those who violate the norms, they had decided to apply an Indian remedy to Rip-off Richard.

I had given the class the opportunity to vote on whether they wanted the third study sheet on line; not surprisingly, they said no. However, Rachel, Doris, Charles and Morris came to me after class and asked if there was any way they could have a "closed" conference for just them to work on the study sheet; I told them that the only way would be through private messages sent to themselves as a set. In the

end, they reverted to a pencil-and-conversation study group.

3. The Hopi-Navajo land dispute; a successful debate

The last on-line assignment concerned one of the most distressing problems between modern Indian tribes, a dispute between the Hopi and Navajo tribes over the "joint use area"; there are no villains, just a situation in which everyone loses somehow. The class had studied both traditional and modern Hopi and Navajo. Some class material about the Land Dispute was distributed, and students were asked to go to the library and read as much as they could find about the situation. They were then to put the references they found into the conference, and were to take a position about the questions raised. They could take the Hopi side, the Navajo side, represent the interests of Peabody Coal Company, or address a legal question, but they had to justify their position in the on-line comment. At this point in the semester most of the non-participants had dropped from the class by one route or another; even Rip-off Richard entered a position on this question.

The similarity between this assignment and the first assignment is clear. Students did a much better job on this assignment than in the first one. The in-class debate went extrordinarilly well. On the basis of their conference comments, students identified those who had developed a similar position and were given part of a class period to caucus and come up with major points. Since it turned out that there were four positions [Hopi,Navajo, Federal responsibility,and a "plague on both your houses"] the classroom was rearranged in a square, and the debate began. I wish I had recorded it; students

referred to each others conference comments ("How can you say that when you are contradicting what you wrote?), challenged the articles (" But that article was in local newspaper and MINE is in a professional journal") and were able to present a lot of data in a short time. We ran well over the class schedule into lunch and no-one noticed.

WOULD I DO IT AGAIN?

Yes.

The parts that worked well were repeating similar assignments so students got used to particular types of work on the network. I need to give some more thought to cooperative assignments; this has been discussed at some length in our project meetings, and is something I am still working on. Parts of the experience that still need work are improving access to computers, since none of the students own terminals, and improving the response time of the software.

One interesting result of this semester was to note that students are like themselves, only more so, when on line. The chatty ones write long responses, the worriers modify their messages, the dutiful ones do what is required reliably but without brilliance, and the irresponsible are conspicuous by their absence.

A second observation of on-line teaching is that any flaw in the normal class situation gets magnified. The students who skip classes and don't do work on time skipped EIES instruction sessions and were late or never in submitting responses. Where an assignment needed more thought on the part of an instructor it shows in the student

struggles. In the case of the Indians course, both the students and the instructor had to face both the positive and negative group dynamics even more clearly than a solely face-to-face class.

FOOTNOTES:

1. None of the writing or bibliography assignments for the course, whether on-line or in class, could have been so smoothly accomplished without the cooperation of the reference staff of the Upsala library. I gave them a copy of the assignments for the course at the beginning of the semester; their tactful help to the students reduced the library time and gave more time for the on-line work for the students.

2. The brighter students of course figured out that if they printed the conference they got a complete set of the questions, if not the complete set of answers.

3. It later transpired that one had dropped the course, one was hospitalized, and one was just avoiding the possibility of work.

ORGANIZATIONAL COMMUNICATION, Fall 1986

Roxanne Hiltz, Instructor

This was a small course with only 11 initial enrollees, of whom two came once or twice and then disappeared. Virtual Classroom was used in adjunct mode to support approximately half of the laboratory exercises or homework assignments. In addition, during the semester I had a 15-day trip to professional meetings. During that time, all coursework occured online, and extensive private messages were also exchanged.

The first assignment consisted entirely of familiarization with the EIES system, including sending a private message and entering a conference comment consisting of a self-introduction. The second and third online assignments were individual. Each student was to present a case study that applied abstract concepts and theories covered in the course to actual organizations of which they had been a part. A pseudonym was to be used for the name of the organization, and the case studies were entered with pen names as branch activity responses. The third set of online activities occured during the travel period of the instructor, with several "electure" segments presented, followed by questions in response branches, which were graded as an assignment. The final formal online assignment required collaboration or cooperative effort among the students. Each student chose a reading and was responsible for summarizing its main points for the rest of the class, and then for entering one or more questions for discussion as a response branch. They were then given a grade for a combination of their responses to others, and of the number of responses to their questions.

Two final activities were also conducted online. One was a review for exams, in which students were asked to think of exam questions and to enter them as a response branch, after which they could read some proposed questions by both the instructor and other students. They were told that most of the examination would be selected from questions proposed online. Finally, for the last presentation, students were allowed to choose whether they wanted to do it online or face-to-face in class. Three chose to make a written presentation online.

Half of the course grade was based on the laboratory exercises and assignments; and in turn, half of these were online, and half written offline or done as oral presentations. Thus, a total of 25% of the students' grades were based on their online activities.

Kendy Rudy has written that students are themselves online, only more so. That was also true for organizational communication. The students who regularly attended class and completed assignments on time when they were offline, also regularly used the system, and did their online activities on time and well. Students who tended to miss a lot of classes and to be constantly late in doing any kind of assignment, were even more tardy in getting around to signing online and participating in the online activities. Then there were the "plodders," who attended class most of the time, but did not seem to be doing the readings or relating to the material with any excitement. They tended to participate in a minimally competent way online, too; their entries were often past the deadline, of a minimal length, and not very insightful.

The main problem with the virtual classroom components of this course was a lack of "critical mass." With only nine students, many of whom signed online only every few weeks, the more active students

(and the instructor) were often frustrated by a lack of lively activity in the conference. It would have helped a great deal to have at least three or four more active, involved students. A second and related problem was that the online assignments were sporadic, rather than being spread throughout the course, so that students never developed the habit of regularly signing in a couple of times a week. It would have been better to have more of the assignments online. However, two weeks of topics and assignments required graphics (to diagram organizational charts and informal information flows in organizations), and the graphics software that could have supported this was not ready. Another two involved practicing as well as studying oral communications forms and skills in the organization (the interview and the formal presentation), and these could not be done online, either. We also had problems with software; branch was particularly slow and buggy at the beginning of the semester, and quiz was not ready. Though using branch in that state was valuable and necessary in order to locate bugs and problems, it did not help the attitudes of the students.

There were two students who were extremely negative about using a computer system. One dropped out, stating that he was not willing to take any course that required computer usage. The other plodded through the online assignments resentfully for the whole semester. On the other hand, there were some students who genuinely enjoyed and valued their experience in communicating online. They sent many private messages to the instructor on personal as well as course-related matters, and I felt closer to them by the end of the semester than to any students in any courses which did not include online communication. They were frustrated by the low level of activity of many of the other members of the class, particularly for

the assignment in which their grade was dependent partially on other students entering material and responding to questions in a timely manner. The mixed responses of the students are reflected in their answers to the open-ended questions on the post-course questionnaire:

QUESTION: WHAT ONE OR TWO THINGS ABOUT YOUR VIRTUAL CLASROOM EXPERIENCE DID YOU LIKE THE BEST?

"I liked entering homework on the terminal."

"Not having to go to class"

"Learning the computer"

WHAT ONE OR TWO THINGS ABOUT YOUR VIRTUAL CLASSROOM EXPERIENCE WERE THE "WORST," THE MOST IN NEED OF IMPROVEMENT?

"I would rather do written assignments"

"The branch feature"

"System too slow"

"Static on the system"

OTHER COMMENTS OR SUGGESTIONS FOR IMPROVEMENTS

"Students should have had a choice in whether or not they used the computer"

"I disliked using the computer but I liked the class"

"Branch should be faster"

For this particular course, one of the key topics is the relationship between mode of communication, and the outcomes of communication, within an organization. Thus, using CMC is a "natural" in experiencing first hand some of the ideas in the readings. If I had the opportunity to do this again, I would make two changes. One would be to work with the more reluctant and inept system users on an individual basis at the beginning of the semester, to get them more comfortable with using the system. This first time, I tried a "laissez-faire" or hands=off approach, to see how they would do on their own, with just the initial group training session

and their peers to help them out. Secondly, I would make sure that use of the system was spread throughout the semester, with some sort of online activity or assignment due every week; if nothing else, a one-question quiz on the assigned readings. This would keep the students in the habit of signing online, and support continuous rather than sporadic online exchanges.

PEER WRITING GROUPS IN THE VIRTUAL CLASSROOM

Mary Swigonski, Ph. D. Upsala College

The following is a set of reflections on my experience with the use of EIES as one component in a freshman writing seminar centered around the topic of friendship. My initial response to the possibility of including the use of EIES as an element within this course was one of nearly unbounded enthusiasm. Over the previous several years I had developed somthing of an addiction to the use of computers for word processing. The opportunity to share with students that discovery and the enhancements it can provide to one's writing seemed too good to pass up! Even more wonderfully, the possibilities that EIES held for peer review and collaborative writing seemed truely delightful. This was to be an opportunity designed in heaven!

To give you a sense of how this undertaking evolved, I have included the course description and objectives as they were presented to the students who enrolled in the course. These are followed by a few comments about some of the objectives and the focal topics that provided the developmental trajectory of the course. Then I have highlighted some of the writing assignments, discussing how the use of EIES was incorporated into these projects. And, finally I have included some comments along the theme of "if I had to do it over..."

COURSE DESCRIPTION:

> Friendship plays an important role in each of our lives, as a source of laughter and tears, of inspiration and frustration, of love and loneliness. Poetry, short stories, essays, social science theory and research, and children's fiction will be explored to discover some of the fantasies, feelings and facts that other authors have sought to convey about friendship. Examination of these works will provide a beginning point for our own writing in this area.

This semester an experimental component is included within this course. In addition to traditional teaching/learning methods, interactive computerized conferencing will be incorporated into class activities. Students will be expected to use this computer system and its word processing capability in the writing of their assignments and to supplement classroom activity.

OBJECTIVES:

This is primarily a writing course. You will be expected to write regularly and to write often. My hope for each of us is that by the end of the semester we will grow to appreciate more deeply the beauty and power of our language; that we will learn to play more skillfully with words and ideas. Adrienne Rich, a poet, suggests that the adept use of language is one of the most powerful tools available to human beings. She says that writing is a process of "Re-vision" through which we can change our lives and the world in which we live!

Through active participation in this course, you will increase your knowledge and/or skill in the following areas:

- the meaning of friendship, and select concepts associated with it;
- the use of resources housed in the Upsala library;
- precision in critially reading and analyzing ideas, one's own and those of other authors;
- the effective communication of your thoughts and ideas through written presentation;
- the ability to work collegially, within a small group context, to develop, organize and prepare thoughts and ideas for presentation to a larger audience;
- the use of computers as a tool for preparing and disseminating ideas.

These objectives can be organized in three layers. The primary level focuses on developing the students skill in writing in general and in writing about friendship in particular. In order to do that the secondary layer of objectives comes into being, that the students also develop greater skill in critical thinking, and that they learn to work collaboratively. For this experimental version of the course a third layer of objectives was introduced, that the students develop skill in the use of word processing and of an interactive computer system.

The course was organized around the following topics:

- Introduction and Overview
- What is Friendship
- Friendship and Self Perceptions

- Friendship and Gender Differences
- Emotions, Ethics and Friends
- Marriage, Divorce and Friendship
- Beyond Friendship (how and why friendships end)

I intended that the class would use EIES to facilitate both word processing and collaborative learning. To accomplish that the class was divided into three "working groups" with six or seven students in each group. These groups were each given a conference space, and all assignments were to be written there. Each assignment was to be "peer reveiwed" by all others in the conference, with the comments typed into that area. The entire class also had a conference in which discussions on friendship-related issues were to occur.

TRAINING:

During, the first class meeting the experimental component of the course (the intended use of computers), was explained to the students, and they were given an opportunity to transfer into another section if they so desired (no one did). Once the fundamentals of the course were laid out, an in-class discussion was held about the EIES system, introducing messages, conferences, and the role they would play in our class. The students were provided with the EIES manual, and an EIES survival sheet, and were then taken to the college micro computer lab, for a hands on demonstration of the EIES system. Working in pairs, all students were shown how to "sign on" to the system, how to input information into their directory and how to send a message. In a subsequent demonstration they were shown how to use the conference area, and were introduced to basic text editing commands.

ASSIGNMENTS:

The students first assignment was to write a brief description of themselves in their directory, and to send a brief message to

their instructor. This proved more harrowing then it sounds, and was only accomplished by some after much effort on the part of the students, and significant hand-holding by the computer room assistants! Once this was accomplished, subsequent assignments were of two general characters. One set was longer writing assignments to be included in the work conferences. These were to be peer reviewed by the other students in that conference, and then revised by the original author to incorporate the suggestions of their colleagues. The second set of assignments was shorter discussion questions that were included in the larger class conference. Each student was to check into the class conference on a weekly basis and contribute to the discussions in progress there.

One example of the type of assignment, and the peer review questions applied to it, is shown below. This topic followed the conclusion of the section on friendship and gender differences.

> In your "work" conference, write about 50 lines, (more or less) on the following topic: Men and women form different types of friendships. a) explain what some of these differences are; b) and what some of the causes of these differences might be; then c) suggest some things that might improve the quality of friendships for both men and women.

PEER REVIEW QUESTIONS

In order to complete their peer review, students were expected to complete the following questions about each others drafts.

1) Does the essay fulfill the assignment?

2) Write a sentence or two that summarizes the main point of the essay.

3) Note any weak spots in the organization.

4) Give a suggestion to improve the introduction.

5) Give a suggestion to improve the conclusion.

6) Are there any paragraphs that need particular improvement?

7) Can you offer any suggestions to improve vocabulary or grammar?

Discussion writing assignments posed in the full class conference included the following topics:

- What is friendship?

- Why do friendships occur? Why do we need friends?

- Why do people become friends?

- What does friendship mean to you? How do you think attitudes toward friendship change with age?

- "We learn much about ourselves in our relationships with friends, learning that comes partly from who they are, how they respond to us, what we see reflected in their eyes. Friends become for us a mirror on the self..." What have you learned about yourself through your friends?

- How have your friends helped you to learn who you are, or who you can be?

- Are your friends similar to you or different from you?

- Do you have different types of friends -- people whom you like, but who may not especially like each other?

- Describe your ideal spouse.

- Can friends introduce sexuality into their relationship and still remain friends? (This was everyone's favorite discussion topic!)

FUTURE SUGGESTIONS:

Several problems are now apparent with this plan. The work conferences, with six or seven students in each conference, were too large and unwieldy. It is now apparent to me that peer review works most effectively with groups of three (or at most four) students. When the group size expands beyond four, the simple volume of work required of the students (to read and comment on five or more papers, and then to read the comments of five student on their own paper) becomes excessively cumbersome.

Student procrastination is also a significant issue that is magnified with the size of the group. Students cannot comment on

papers that have not yet been written, and they similarly cannot incorporate peer comments that do not exist! In face-to-face situations eye to eye contact is a wonderful motivator, inducing both guilt and action. Electronic connections (or disconnections) enabled students in work groups to simply avoid each other and the guilt until the last possible moment, which was often too late for meaningful peer contributions to be made.

Large groups size also exacerbated othe peer review issues, particularly the politeness syndrome: if I'm nice to everybody, then they will be nice to me; if I say something critical, then they won't like me; if I say something critical, then they will criticize me! In order for collaborative learning to be effective, future implementations of this sort of project will need to intentionally overcome the politeness syndrome early on in the semester.

Also, students use of EIES seemed to be impeded by their unfamiliarity with typing in general and editing commands in particular. Future projects might profit from the incorporation of assignments that specifically attend to the development of this knowledge and skill so that the technology is experienced by the students as enabling and not a disability. In particular, students need to be encouraged to spend more time online so that they can overcome the initial frustration of mastering a novel experience. One way that this might be accomplished is to begin with a series of very short writing assignments and gradually increase the length as students develop facility with the technology.

VIRTUAL CLASSROOM REPORT

"STATISTICS FOR TECHNOLOGY" ON EIES

AN OVERVIEW FOR TWO SEMESTERS

INSTRUCTOR: ROSE ANN DIOS

In this report I will discuss the experience of teaching a technically oriented statistics course on EIES. I had received a year's training in preparation for this project, since I had not been familiar with computerized conferencing prior to the fall of 1985. It was in the fall of 1985 that I had the opportunity to engage in the exchange of messages, participate in public and private conferences, and observe the delivery of a course on the subject of "Artificial Intelligence" given electronically at the New School in New York. I experienced the excitement and intellectual stimulation of witnessing clever, philosophical debates on the issues surrounding the question of existence of life and the attempt to understand boundaries of life and death. It was truly a learning experience for me and I felt challenged to attempt the delivery of a course on a subject whose traditional mode of presentation was completely at the opposite end of the spectrum: a heavily mathematical course treating essential topics in probability and statistics, and the applications of these theories to technological problems.

It had always seemed to me that a critical component of this course should be the treatment of the philosophical foundations of probability and statistics, as well as a discussion of the relevance of these theories to current decision-making, particularly on highly controversial issues (such as nuclear power, strategic defense,

etc.). And so I embarked upon the course by devoting the first week to an historical and philosophical discussion of the theories of probability and statistics with an emphasis on applications to decision theory and risk analysis. The students were surprised -- some pleasantly, others not. They had expected the course to deal solely with the mathematical treatment of these concepts. More surprises were forthcoming since one of my goals was to make the course an exciting learning experience.

Initial training on EIES for the students

In the fall semester, the course was scheduled to meet on Monday night from 6:15 to 9:20 PM. The first class night was entirely devoted to acquainting the students with EIES and trying to communicate as much information as possible on the different features of the system without overwhelming them. Students were provided with a manual and other helpful documents and were asked to log on. Once on the system, they received some private and group messages extending welcome, and were asked to practice sending messages to each other and the instructor. They were then led to the course conference and there they found awaiting them an eighteen page discussion of the philosophy of probability and statistics culminating in an assignment which included three opinion-oriented questions. Realizing that it would have been better to allow a week without course material for practising the use of the system, this material was presented during the second week during the spring semester course.

Teaching assistants and other project personnel were available during this training session of three hours but students still felt uncomfortable with the system and requested additional training time. A second training session was scheduled for the following week which

was particularly useful to those students who registered late for the course and had missed the first class meeting. After the second training the consensus was positive and students felt further encouraged by knowing that teaching assistants would staff the Virtual Classroom laboratory during regular hours and would be available for both help with the system tutorial assistance with the course content during designated times. In addition, the instructor held regular office hours during this week and would visit the laboratory on Monday evenings.

Course content and syllabus

Statistics for Technology

WEEK	TOPIC
1	EIES Training Philosophical foundations of Probability theory Philosophical foundations of classical decision theory Bayesian decision theory, and Risk Analysis Current issues in technology.
2	Descriptive Statistics Frequency distributions Measures of Central tendency Measures of Dispersion.
3	Chebyshev's Theorem Axioms of classical probability theory
4	Combinatorics (Permutations, Combinations) Fundamental Identities General Counting techniques Tree diagrams; 2 dimensional grids
5	Elementary set theory Venn diagrams General addition rule for probabilities Conditional probability Concepts of Independence and Dependence General multiplication rule
6	Bayes Theorem Theorem of Total Probability Applications
7	Midterm Exam
8	Sample Spaces; Events; Probability Distributions Random Variables and their means and variances
9	Expectation theory Classical decision theory
10	Binomial Distribution Hypergeometric Distribution Sampling with and without replacement Fundamental theorems
11	Applications to demography, epidemiology, etc. Continuous random variables. Uniform distribution
12	Normal distribution Normal approximation to the binomial

13	Sampling distributions Fundamental theorems Central limit theorem
14	Confidence intervals Hypothesis testing
15	FINAL EXAM

Course assignments, quizzes, tests, exams

It was announced to the students that lecture material would be entered into the course conference weekly (or biweekly depending upon student feedback, and performance on homework assignments, quizzes and tests) with the exception of midterm exam week during which an online test would be administered. They were expected to sign on at least weekly in order to receive the lecture, submit homework and take quizzes and tests as scheduled. The course required the submission of twelve homework assignments as well as the completion of eight online quizzes in the form of individual response branches, and four online tests using the +quiz feature. Homework assignments were due sometime between seven and fourteen days after they were announced and the students were asked to enter their solutions to the given problem as a conference comment, thus sharing them with the rest of the class. Each student received a different homework problem or set of problems with the goal of maximizing the diversity of examples and simultaneously encouraging individual work. But some students were very upset because they felt that the problems they had received were far more difficult than those of their peers, and realistically it was impossible to maintain the same level of difficulty throughout the entire problem set. Moreover, from a pedagogical perspective, a variety of difficulty is preferred. This issue was remedied by the use of response branches allowing for the entire class to answer a given question prior to viewing the solutions presented by others. These questions were classified as quizzes but possessed the same point value as the homework assignments. The twelve homework assignments and eight quizzes constituted twenty-five percent of the course grade.

Fifty percent of the grade was determined by performance on the four tests given electronically. Students were asked to sign on for the test sometime over a designated two-week period and they were given sixty minutes to complete the test. When the related software was being developed some problems arose with the taking of online tests. Students were cut off from EIES because they sometimes did not enter any material onto the system for over twenty minutes (the standard time-out value) during which time they were solving the test problem on paper. Also, since the system was designed to prevent signing on to the test a second time, students had no recourse but to contact the instructor and submit their test on paper through interoffice mail. The online test software was then changed to eliminate these problems. Many students, however, had been struggling with other problems related to the use of EIES and then fell into the pattern of submitting all work through either interoffice or external mail. The instructor accepted all work submitted in this fashion because it also became necessary to mail out some of the lectures that were heavily dependent upon diagrams and complex formulas including symbols not available on screen. The PTEIES software that would facilitate the delivery of such lectures electronically was still in the process of development.

Fall Semester: Some Problems and Some Benefits

Some of the other problems experienced by students were related to the initial due date of assignments. Since the course was originally scheduled to meet on Monday evenings, initially assignments, quizzes and tests were due by Monday midnight. Although students were allowed to submit their work anytime during the week, they regularly came to the Virtual Classroom laboratory on Monday evenings with the intention of entering their work and receiving the

material and assignment for the following week. Since user density is so high on Mondays, the response time of the overloaded system was very frustrating to those students experiencing a time pressure, especially if they were using the Branch software which is slow even when the EIES syste is under moderate use. I addressed this problem by changing the due date of assignments from Monday to Wednesday, but many of the students continued to come on Mondays because they had classes (or other unalterable commitments) on the other evenings of the week. Most of the class held full-time jobs during the day. The instructor continued to visit the Virtual Classroom laboratory on Mondays to offer assistance since this time was most suitable to the majority of the class. Students would frequently submit their work in person at the laboratory.

Another problem that became evident was that of inappropriate exchange of information on quizzes and tests. The instructor was able to identify those students who had indeed mastered the material by their performance on the face-to-face final examination. It was very clear that one of the students who had received high scores on the online tests did not understand certain critical concepts of the material. The final examination, which constituted the final twenty-five percent of the course grade, had the effect of appropriately adjusting the final grade.

Messages were sometimes sent by students requesting information or assistance with material to the instructor, but most often the request was for a face-to-face appointment and/or telephone conversation, and arranging a time to meet in the laboratory. Students would meet with each other in the laboratory and exchange solutions to difficult problems and other important information and would often schedule the meeting time through the exchange of private

messages. A strong sense of comraderie was present at these meetings, and the instructor and students agreed that the course mode of delivery was in many ways responsible for the sense of teamwork present.

There are two special cases that warrant mentioning since they really capture some of the benefits of the Virtual Classroom. First, a student who registered for the course in the fourth week of the semester because of a preceding hospitalization was able to make up all of the lost time in two weeks because he had complete access to all of the lecture material and homework assignments. This student received the highest grade in the class for the final examination! Secondly, another student became a parent for the first time in the middle of the semester. Because of complications, he missed five weeks of the course but was also able to, upon his return, make up lost work and quizzes to complete the course with a grade of "B". Both of these students felt that their success was possible because of the unique mode of delivery.

A comparison of the control and experimental groups

An observer recorded a week of face-to-face class and compared the interaction to that in the conference transcript for the same period. It was observed that students in the face-to-face class asked many more questions than those in the online class. This may have been due to many factors, but it is important to note that the face-to-face class had twice as many students as the online class. In addition, the students in the face-to-face class frequently asked their questions directly to the instructor at the time of dismissal rather than during the actual class time when the rest of the class would have been able hear it. The online students also asked most of their questions in face-to-face meetings with the instructor, so

there really may not have been that great a difference in the relative proportion of question asking if all modes of communication had been taken into account.

Both classes did very well on the final exam and many students received an "A" or "B" for the final grade. But the online students communicated the feeling that the course had been more valuable to them when discussing it with the instructor.

Fourteen students were initially enrolled in the fall online course and nine students completed the course. In the face-to-face section only one student did not complete the course. Those students who withdrew from the online class did so at the beginning of the course. Of those who remained in the course beyond the first three weeks of the semester, all but two students (who received grades of Incomplete) completed the course.

The Spring Semester Online Class

There was a great boost in enrollment for the spring-term online class: twenty-seven students registered for the course and twenty-five completed the course, with a large number of A's and B's given as the final grades. The course ran very smoothly in the spring since most of the major problems had been identified and remedied during the fall semester. We were able to implement some additional software into the course process: the use of SELECTION branches; and the use of the graphics package, PTEIES.

Selection branches allowed students to choose their own homework problems with the condition that those who signed on first had the greater choice option. Students felt that this was very beneficial because it once again allowed for a greater variety in the review of homework problems. It also made the assignment of final course projects more efficient and allowed students to choose those projects

(or questions) most relevant to their unique undergraduate course of study.

The PTEIES package allowed the instructor to create some basic diagrams and equations for the lecture material. The primary setback was that most students had to use PTEIES in the laboratory since their home machines often lacked the necessary memory size to employ the package.

Conclusions

There is no question that the electronic delivery of a mathematical course is a challenging experience to both the instructor and the students. But it is a goal well worth achieving. Both the instructor and many of the students in the project felt that the pluses outweighed the minuses. Many students felt a strong sense of accomplishment for their mastery of the skills of computerized conferencing and statistics.

Baath, J. A., (1982). "Experimental Research on Computer Assisted Distance Education." In J. S. Daniel, M. A. Stroud, & J. R. Thompson (Eds.), Learning at a Distance: A World Perspective (pp. 303-305). International Council for Correspondence Education. Edmonton, Alberta: Athabasca University Press.

At the University of Lund, Sweden, two different versions of the same correspondence course were offered: a traditional course with a tutor, and a computer-assisted two-way communication (CADE) system. The outcome favored the computer-assisted system in both performance and attitudes.

Brown, Fred D., (1986). "Telecommunications in Higher Education: Creating New Information Sources," Technical Horizons in Education Journal (August), 68-70.

The provost of Buena Vista College describes the use of a broadband network and VAX computers in support of various group-oriented courses.

Bissell, Stan A., Coombs, Norman R., Medvedeff, David J., and Rogers, Susan M., (1987). "Distance Teaching Techniques Using Electronic Conferencing," Proceedings, The Second Guelph Symposium on Computer Conferencing, University of Guelph, Guelph, Ontario Canada, 3- 9.

Describes use of computer-based communications to improve student-teacher interaction in two media-based courses at Rochester Institute of Technology. The system uses VAX Notes and mail software. Faculty and staff involved with the design and instructional application offer observations to others involved with this technology.

Boyd, Gary M., (1987). "Emancipative Educational Technology," Canadian Journal of Educational Communication, 16, 2 (Spring), 167-172.

Liberation or emancipation is increasing a person's abilities to make rational choices about matters important to that person. The close match between Habermas' criteria for "emancipative discourse" (discussion with others where the outcome is determined by the best argument, not by promises or threats or captivating art or music) and the main characteristics of computer-mediated conferencing is said to favor this medium for education.

Brochet, M. (1985, January 22-23). "Computer Conferencing as a Seminar Tool: A Case Study." Paper Presented at the Workshop on Computer Conferencing and Electronic Mail meeting of the Institute of Computer Science, University of Guelph, Guelph, Ontario.

Describes the introduction of the COSY computer conferencing system to a group of graduate students in a seminar of the School of Extension Education at the University of Guelph.

Chapman, Dale T., (1986). "Campus-Wide Networks: Three State-of-the-Art Demonstration Projects," Technical Horizons in Education Journal, (May) 66-70.

Describes the networking projects at Carnegie-Mellon, MIT and Brown university, which mention CMC systems as key elements.

Coombs, Norman, (1987), "Computer Conferencing at RIT, Education Magazine, Issue 44, 17-19.

A blind professor of history describes how he uses VAX Notes to teach Modern American History. A speech synthesizer "reads" him his mail. Also reports that the students in two conferencing sections scored higher mean grades than students in two control sections. Very briefly describes future plans to adapt the course for a class of deaf students.

Davie, L. & Palmer, P. (1984). "Computer-Teleconferencing for Advanced Distance Education." Journal of University Continuing Education, 10(2), 56-66.

Describes the use of computer teleconferencing for the implementation of an advanced distance education course.

Davie, Lynn E., (1987). "Facilitation of Adult Learning Through Computer Conferencing," Proceedings, The Second Guelph Symposium on Computer Conferencing, University of Guelph, Guelph, Ontario Canada, 11- 21.

Reports on the experience of offering two graduate level distance education courses through a computer conference, using Participate. The design of the course is presented, including the use of "learning partners" for a cooperative writing assignment, followed by an analysis of student participation, satisfaction, and achievement. The results are discussed in terms of different facilitation techniques and different learning styles.

Eldridge, J. R. (1982). "New Dimensions in Distance Learning." Training and Development Journal, 36(10), 42-44, 46-47.

Evaluates the use of an electronic bulletin board in an undergraduate engineering course. The Author concludes that the use of the bulletin board brought the group together in a way that would otherwise not have been possible and helped to create a "group" sense among the students.

Haile, P.J., (1986). "An Analysis of Computer Conferences Supporting the Distance Learner." Paper presented at the annual conference of the American Educational Research Association, San Francisco, CA, April.

Applications of computer conferencing which employed a highly teacher-structured and teacher-dominated approach did not

noticeably improve the attrition rates or student scores. Suggests the possibility of a positive direct relationship between teacher behaviors which stimulate student participation and students' retention in distance learning programs.

Harasim, Linda (1987). "Teaching and Learning On-Line: Issues in Computer-Mediated Graduate Courses," Canadian Journal of Educational Communication, 16, 2 (Spring), 117- 135.

Beyond enhancing and expanding educational access, computer-mediated communications offer significant potential for effective new learning and research interactions. Two graduate courses delivered via Participate by the Ontario Institute for Studies in Education are described. The course design built upon the distinctive character of the conferencing system to develop a learner-centered, group learning approach. The branching facilities of Participate were employed to provide spaces for core and optional learning activities, for plenary, small group and working group discussions, and for informal (social) interactions. Analysis of the rate and volume of participation indicates very active involvement of the students, relatively equal interaction between students and instructors, and positive student assessments of the effectiveness of learning. Difficulties included information overload, asynchronicity (delayed responses), inconvenience of increased access (the continuous nature of the course); and health concerns (eye strain, sitting still so long).

Harasim, L. & Johnson, E. M. (1985, January 22-23). Educational Applications of Computer Conferencing for Teachers in Ontario. Paper presented at the Workshop of Computer Conferencing and Electronic Mail meeting of the Institute of Computer Science, University of Guelph, Guelph, Ontario.

Reports preliminary results of an on-going project to investigate the potential of computer networks and conferencing systems for the delivery of distance education and professional development programs to teachers in Ontario. The focus in the paper was on one aspect of the larger study: how to employ computer conferencing applications for the adult learner.

Harasim, Linda, and Johnson, E. Marcia (1986). Educational Applications of Computer Networks for Teachers/Trainers in Ontario, Ontario Institute for Studies in Education, Toronto, Canada.

Synthesizes existing knowledge of computer conferencing to indicate how it could address needs in Ontario. Strategies and guidelines for introducing CMC into educational activities are provided. Includes an extensive annotated bibliography, from which several of the entries in this bibliography were adapted.

Hart, Roger (1987). "Towards a Third Generation Distributed Conferring System.," Canadian Journal of Educational Communication, 16, 2 (Spring), 137-152.

The first of the RAPPI (reseau d'ateliers pedagogiques, pilote international) projects enabled Grade 2 to Grade 12

students in over 60 schools in four countries to use a computer conferencing system to share information about themselves, their school, their community, their culture, and their curricula. Evaluation confirmed that it is not sufficient to simply provide the hardware and the software: major efforts must also be placed on teaching people to make effective use of the hardware and software, and developing the organizational arrangements to ensure that the participants are able to use it effectively.

Kaye, Tony (1987). "Integrating Computer conferencing Into Distance Education Courses: A Discussion Paper," Proceedings, The Second Guelph Symposium on Computer Conferencing, University of Guelph, Guelph, Ontario Canada, 23- 32.

This paper raises a number of question about the use of computer-mediated communications in multi-media distance education courses aimed at large numbers of home-based students. Reference is made to current plans to use COSY on a new Open University course in the UK for about 1000 students in 1988. Particular emphasis is placed upon the expected role of the tutor in the conferencing situation.

McCreary, Elaine K. and Van Duren, Judith, (1987). "Educational Applications of Computer Conferencing," Canadian Journal of Educational Communication, 16, 2 (Spring), 107- 115.

Ten different educational functions of computer conferencing used at the University of Guelph are described, along with influences on the type and rate of student participation. It was observed that, given adequate orientation and training along with a compelling reason to use the system, students will participate despite inconvenience of hardware location, whereas convenience of hardware does not seem to compensate for inadequate training or a marginal reason for system use. Recommendations for successful academic conferencing are provided, emphasizing the importance of training and assistance.

Quinn, C. N. et al. (1983). "Real Education in Non-Real Time: The Use of Electronic Message System for Instruction." Instructional Science. 11(4), 313-327.

Examines instructional interaction among people using a computer-based electronic message system, contrasting it with conventional face-to-face discussion in a college level class. Interaction via the message system contained multiple "threads of discourse", and a higher proportion of student turns to teacher turns.

Riel, M. (1983). "Education and Ecstasy: Computer Chronicles of Students Writing Together." The Quarterly Newsletter of the Laboratory of Comparative Human Cognition, 5(3), 59-67.

Describes a project in which students in California and Alaska exchanged information with each other via "The Source," or by mailing "letters" to each other on computer diskettes.

Santoro, Gerald M. (1987). "Making the Connection-- Instructional

Applications of Computer-Mediated Communications." Paper presented at the 1987 convention of the International Communication Association, Montreal, Canada.

CMC was used as a support mechanism to augment two speech communications classes at Penn State. A particular focus of this pilot project is the kinds of problems and constraints that are encountered in using CMC for very large classes. With an initial linked group of about 70 participants, the instructor was receiving about 30- 40 messages a day, not counting assignments. One solution to the problem Penn State intends to explore is to designate the section instructors or counselors to be "gatekeepers" who will handle the simple problems at their level, and refer only the important problems to the professor.

Schroeder, R. E. (1981). "Computer Conferencing: Exploding the Classroom Walls." Technological Horizons in Education, 8(2), 46.

By using several features of the PLATO computer-aided instruction system, students in Illinois and Hawaii who were taking similar courses were able to communicate with each other and conduct topical discussions.

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